A3278-85

Vol. 57 No. 11 November 1982

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Continuing Medical Education: 1960s to the Present
Patrick O'Reilly, Charles P. Tifft, and Charlene DeLena

Needs Assessment in Continuing Medical Education: A Practical Guide
O. E. Laxdal

Selective Patient Enrollment: A Tool for Improved Residency Training
Barry L. Hainer and Hiram B. Curry

Inside the Chart Review
Peter Curtis, Bron Skinner, Eleanor Bentz, and Alan Purvis

Clinical Reading and Writing Skills of Junior Medical Students
Joseph A. Flaherty, Agnes Rezler, and Christine McGuire

Supplement

The Maintenance of High Ethical Standards in the Conduct of Research

Journal of Medical Education

Volume 57 • Number 11 • November 1982

Continuing Medical Education: 1960s to the Present—Patrick O'Reilly, Charles P. Tifft, and Charlene DeLena 819

Needs Assessment in Continuing Medical Education: A Practical Guide—O. E. Laxdal 827

Selective Patient Enrollment: A Tool for Improved Residency Training—Barry L. Hainer and Hiram B. Curry 835

Inside the Chart Review—Peter Curtis, Bron Skinner, Eleanor Bentz, and Alan Purvis 841

Clinical Reading and Writing Skills of Junior Medical Students—Joseph A. Flaherty, Agnes Rezler, and Christine McGuire 848

Teaching Behaviors of Residents and Faculty Members—Lawrence P. Tremonti and W. Barry Biddle 854

Faculty Development and Human Resource Management in the Academic Medical Setting—John A. Goldman 860

Communications: **Design of a Course on the Medical Consequences of Nuclear War**—Christine Cassel, Michael Garland, and Michael McCally 866

NBME Part I Examination: Possible Explanations for Performance Based on Personality Type—Michael J. O'Donnell 868

Use of CME Programs: Solo Versus Group Practitioners—Lynn Curry 870

Development of a Clerkship Curriculum in the Family Life Cycle—Elizabeth G. Armstrong, Arnold Jaffe, Jack Froom, and Melville Rosen 872

Developing Oral and Written Formats for Evaluating Clinical Problem-Solving by Medical Undergraduates—G. I. Feletti and A. H. B. Gillies 874

Effects of Behavioral Science Orientations on Attitudes of First-Year Residents in Family Practice—Betty A. Walker, Marilyn Mehr, Kenneth Brummel-Smith, and Elsbeth Kahn 877

Editorial: Preventing and Investigating Fraud in Research 880

Datagram: Applicants to U.S. Medical Schools, 1977-78 to 1981-82 882

Book Reviews 885

Bibliography 887

Letters to the Editor 891

Supplement: The Maintenance of High Ethical Standards in the Conduct of Research 895

Officers of the Association and Members of the Executive Council, 1981-82

CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
CHAIRMAN-ELECT: Steven C. Beering, *Indiana University*
IMMEDIATE PAST CHAIRMAN: Julius R. Krevans, *University of California, San Francisco*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
William H. Luginbuhl, *University of Vermont**
Steven C. Beering, *Indiana University*
John E. Chapman, *Vanderbilt University*
John W. Eckstein, *University of Iowa*
Richard Janeway, *Bowman Gray*
Richard H. Moy, *Southern Illinois*
Leonard M. Napolitano, *University of New Mexico*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
David M. Brown, *University of Minnesota**
Daniel X. Freedman, *University of Chicago*
Virginia V. Weldon, *Washington University*
Frank C. Wilson, Jr., *University of North Carolina*

COUNCIL OF TEACHING HOSPITALS
Mitchell T. Rabkin, *Beth Israel Hospital**
Mark S. Levitan, *University of Pennsylvania*
Stuart J. Marylander, *Cedars-Sinai Medical Center*
John Reinertsen, *University of Utah*

ORGANIZATION OF STUDENT REPRESENTATIVES
Grady Hughes, *University of Washington**
Ed Schwager, *University of Arizona*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

DATAGRAM

Applicants to U.S. Medical Schools, 1977–78 to 1981–82

After a precipitous drop of almost 4,000 in 1978–79, the total number of U.S. medical school applicants remained essentially constant over the next three years (Table 1). However, the number of male applicants fell steadily, and the number of women applicants increased over the period. The percentage of women increased from one-fourth of the total applicants in 1977–78 to almost one-third in 1981–82 (Table 2).

The number of applications from underrepresented minorities (black Americans, American Indians, Mexican Americans, and mainland Puerto Ricans) increased at about the same rate as the total entering class size. The percentage of applicants from this group increased from 8.5 percent in 1977–78 to 9.6 percent in 1979–80, where it remained for the next two years (Table 3).

On the average during the four-year period, each applicant filed about nine applications.

The number of applicants accepted increased from 15,977 in 1977–78 to 17,286 in 1981–82. This represents an increase in the rate of acceptance from 39 percent to 47 percent. Except for 1977–78, women applicants were accepted at a slightly lower rate than males (Table 2). Black Americans and American Indians were accepted at a lower rate than majority applicants, while Mexican Americans and mainland Puerto Rican applicants were accepted at a higher rate (Table 3). An increase in the rate of acceptance of Commonwealth Puerto Ricans was due largely to the opening of two new schools on the island, one in January 1978 and the other in January 1979.

The percentage of accepted students who matriculated in medical school remained at

TABLE 1

Summary of U.S. Medical School Application Activity, 1977–78 Through 1981–82

First-Year Class	No. Schools	No. Applicants	No. of Applications Filed	No. Accepted	No. Matriculated*
1977–78	122	40,569	371,545	15,977	15,493
1978–79	125	36,636	335,982	16,527	16,054
1979–80	126	36,141	335,209	16,886	16,301
1980–81	126	36,100	330,888	17,146	16,590
1981–82	126	36,727	339,975	17,286	16,644

* Number matriculated as first-year new entrants, excluding those repeating, reentering, or continuing the initial year.

TABLE 2

Comparative Acceptance Data for Men and Women Medical School Applicants, 1977–78 Through 1981–82

First-Year Class	No. Applicants			Percent Women Applicants	No. Accepted		Percent Accepted		No. Matriculated*	
	Men	Women	Total		Men	Women	Men	Women	Men	Women
1977–78	30,374	10,195	40,569	25.1	11,896	4,081	39.2	40.0	11,549	3,944
1978–79	27,075	9,561	36,636	26.1	12,352	4,175	45.6	43.7	12,059	3,995
1979–80	25,919	10,222	36,141	28.3	12,156	4,730	46.9	46.3	11,769	4,532
1980–81	25,436	10,664	36,100	29.5	12,196	4,950	47.9	46.4	11,832	4,758
1981–82	25,054	11,673	36,727	31.8	11,953	5,333	47.7	45.7	11,532	5,112

* Number matriculated as first-year new entrants, excluding those repeating, reentering, or continuing the initial year.

TABLE 3

Application and Acceptance Rates of Applicants to First-Year Classes in U.S. Medical Schools by Self-Identification, 1977–78 to 1981–82

First-Year Class	Black American			American Indian			Mexican American			Mainland Puerto Rican		
	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted
1977–78	2,487	6.4	38.8	122	0.3	35.2	487	1.3	46.6	203	0.5	45.8
1978–79	2,564	7.3	37.8	133	0.4	40.6	433	1.2	55.7	191	0.5	48.2
1979–80	2,599	7.4	39.4	151	0.4	42.4	457	1.3	58.4	173	0.5	53.2
1980–81	2,594	7.4	40.7	147	0.4	42.2	449	1.3	53.5	191	0.5	53.4
1981–82	2,644	7.2	39.2	160	0.4	42.5	515	1.4	54.6	222	0.6	50.9
	White			Asian/Pacific Islander			Commonwealth Puerto Rican			Other Hispanic		
	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted	No. of Applicants	Percent of All Applicants*	Percent Accepted
1977–78	32,128	79.2	40.9	1,318	3.2	34.3	345	0.9	34.2		NA	
1978–79	29,709	81.1	47.0	1,520	4.1	36.6	341	0.9	45.7	538	1.5	34.0
1979–80	29,334	81.2	48.3	1,660	4.6	38.2	379	1.0	42.7	582	1.6	41.1
1980–81	28,645	79.3	49.0	1,774	4.9	40.6	465	1.3	47.5	646	1.8	39.6
1981–82	28,998	79.0	48.4	1,976	5.4	41.7	476	1.3	51.7	675	1.8	39.4

* Applicants not specifying race were not included in the computation of percentages. For this reason, some figures may differ from those given on tables for previous years, and the sum of the subtotals of applicants for each racial group does not equal the grand totals listed in Tables 1 and 2.

about 97 percent during the period. The number of first-time matriculants increased from 15,493 in 1977–78 to 16,644 in 1981–82. During this period, the number of first-year places increased from 16,136 to 17,268. Thus, some 3.5 to 4.0 percent of the classes were made up of students who were either repeating, reentering, or continuing the first year of medical school.

Data compiled by Susan N. Sherman, Division of Educational Measurement and Research, Association of American Medical Colleges, Washington, D.C.

Vol. 57 No. 12 December 1982

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Michigan's Medical Service Plan: Factors Responsible for Its Success
Thomas J. Herrmann, David J. Bachrach, and John A. Gronvall

The Use of Management by Objectives in Medical Education Enrichment Programs
John W. Murphy and Richard Redden

The Physically Handicapped Student in Medical School: A Preliminary Study
Maggi Moore-West and Debbie Heath

The Role of Medical Students' Stereotype of Physicians in Sex Education
David M. Schnarch

Psychiatric Education for Primary Care: A Pilot Study of Needs of Residents
Steven A. Cohen-Cole, John Boker, Julian Bird, and Arthur M. Freeman, III

Index to Volume 57

Journal of Medical Education

Volume 57 • Number 12 • December 1982

Michigan's Medical Service Plan: Factors Responsible for Its Success—Thomas J. Herrmann, David J. Bachrach, and John A. Gronvall 903

The Use of Management by Objectives in Medical Education Enrichment Programs—John W. Murphy and Richard Redden 911

The Physically Handicapped Student in Medical School: A Preliminary Study—Maggi Moore-West and Debbie Heath 918

The Role of Medical Students' Stereotype of Physicians in Sex Education—David M. Schnarch 922

Psychiatric Education for Primary Care: A Pilot Study of Needs of Residents—Steven A. Cohen-Cole, John Boker, Julian Bird, and Arthur M. Freeman, III 931

Communications: **Job Satisfaction Among Academic Physicians: Attitudes Toward Job Components**—Antoinette S. Peters and Ross Markello 937

Teaching Interviewing Skills to Students in Clinical Years: A Comparative Analysis of Three Strategies—Mark Quirk and Robert A. Babineau 939

A Prototype Voluntary Community Service Program for Students in the Health Professions—Michael D. Benson, Irwin G. Brodsky, and Leon S. Benson 942

A Study of the Reliability of the Grading Process Used in the American Board of Pediatrics Oral Examination—Diane W. Butzin, Laurence Finberg, Robert C. Brownlee, and Robert O. Guerin 944

Assessing the Oncology Content of the Preclinical and Clinical Undergraduate Curriculum—Martha Kishner, W. Loren Williams, and Tapan A. Hazra 946

Medical Student Attitudes Toward Psychiatry in Relation to Psychiatric Career Choice—Joel Yager, Katherine LaMotte, and Lynn Fairbanks 949

Briefs 951

Editorial: Changes in Social, Economic, and Political Environment Taking Toll on Academic Medical Centers 953

Book Review 955

Bibliography 957

Letters to the Editor 961

Index to Volume 57 963

Officers of the Association and Members of the Executive Council, 1982-83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Mark S. Levitan, *University of Pennsylvania**
Robert Frank, *Barnes Hospital*
Earl J. Frederick, *Children's Memorial Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

The Physically Handicapped Student In Medical School: A Preliminary Study

Maggi Moore-West, Ph.D., and Debbie Heath

Abstract—The research reported here was undertaken as a preliminary study of the physically handicapped student in undergraduate medical education because of the lack of information on the physically disabled in schools of medicine or in medicine itself. A questionnaire was mailed to all medical schools in the United States. Results show very few problems with either the students' academic performance or the institutions' adaptation. Furthermore, when a school accepts one physically disabled student, there appears to be a tendency for the school to accept more.

The equal rights of the physically handicapped have been a legal issue since Section 504 of the Rehabilitative Act of 1973 (1) was enacted. A review of the literature through the use of MEDLINE and ERIC (Education Resource Information Center) revealed little relevant information on the physically disabled in medicine or in schools of medicine. An article (2) by a recent medical school graduate addressed the perceived concerns of medical schools regarding the impact which admitting a physically disabled student might have on the standards for medical schools and on the overall costs of educating students in medicine. While several authors have examined the educational benefits for and rigors of the physically disabled in such professions as social work (3), none has addressed the problems unique to the intensive academic pressure and physical endurance demanded in a medical career. As a result, the present study was undertaken in an attempt to learn the numbers and types of physically disabled students enrolled in schools of medicine, the students' adaptation to the demands of medical education, and the amount of institutional accommodations required by the entry of this new minority.

Methods

A three-page questionnaire was developed by a medical sociologist and a medical student at the University of New Mexico School of Medicine to determine: (*a*) the number of physically disabled students in undergraduate medical education, (*b*) the types of disabilities of the students, (*c*) the students' adjustment to their educational process, and (*d*) the institutional accommodations necessitated by particular disabled students. A draft of the questionnaire was critiqued by faculty members of the school's Department of Family, Com-

---

The study on which this article was based was partially funded by the W. K. Kellogg Foundation and a research grant from the Department of Family, Community, and Emergency Medicine at the University of New Mexico School of Medicine, Albuquerque.

Dr. Moore-West is assistant professor, Department of Family, Community, and Emergency Medicine, and longitudinal project coordinator, and Ms. Heath is a fourth-year medical student. Both are at the University of New Mexico School of Medicine.

munity, and Emergency Medicine and by the dean of undergraduate medical education. After revisions, the questionnaire was sent to the deans of student affairs in all accredited U.S. medical schools ($n = 117$) during the spring of 1980. The questionnaire was accompanied by a cover letter explaining the intent of the research and expressing the hope of eventually establishing an information network among the schools. When several schools expressed an initial concern about the validity of the survey, a second letter was mailed to all schools indicating that the project was funded by the Department of Family, Community, and Emergency Medicine at the University of New Mexico School of Medicine and that there had been communication with the Association of American Medical Colleges about the survey. A third and final reminder note was mailed in January 1981.

The questionnaire cited examples of what was meant by a physically disabled person (for example, wheelchair bound, blindness, deafness) and asked the schools to indicate the number of handicapped students admitted to their school within the past five years.

Results

Sixty-two schools responded to the questionnaire. Of those responding, 20 schools indicated that no handicapped students had been accepted or had matriculated. Thirty-seven schools indicated that at least one physically disabled student had been enrolled in their schools. Five schools responded that they did not keep such data and, therefore, had no way of retrieving the information.

SCHOOLS WITHOUT HANDICAPPED

For the 20 schools that did not have handicapped students enrolled, the average class size was 87 students, and the average age of the schools was 44 years. The main reason given by nine schools for having no disabled students was that none had applied. Two schools indicated that some handicapped individuals had applied but had not been adequately prepared academically. One school did not admit a physically handicapped student because of the severity of the person's physical disability. One school stated that handicapped students could not be admitted because of rigid physical requirements for all students.

To the question of whether their schools were adequately prepared to deal with a physically handicapped student, respondents of 10 schools felt there would be no problem in admitting a handicapped student. Respondents at two schools felt they were not prepared to deal with handicapped students; however, one respondent thought his school would be ready in the near future. Respondents at two schools felt there would be some problems with the physical arrangements. Three felt there would be some need for extra academic support. Two were concerned about the extra emotional support and one about the possible negative attitude of the faculty.

The benefits of eventually admitting a physically disabled student, as perceived by the respondents, would be that such a student would provide class diversity, a role model for peers and patients, and a new level of awareness by faculty members and students alike.

SCHOOLS ENROLLING HANDICAPPED

Schools admitting physically disabled students had an average class size of 123 students, and the schools had an average age of 67 years. As a group, the schools provided data on an average of 1.9 handicapped students admitted per school, during the studied period, 1976 through 1980.

When the disabilities were categorized by particular handicap (for example, wheelchair bound and deafness) and ana-

TABLE 1

U.S. Medical Schools' Assessment of Handicapped Students Enrolled Between 1976 and 1980

Handicapped Students	Type of Handicap of Students in Medical Schools								
	Wheelchair (n=13)	Visual (n=7)	Amputee (n=11)	Deafness (n=7)	One Arm (n=7)	Hodgkins Disease (n=4)	Cane-Walking (n=6)	Hand Deformity (n=3)	Misc. (n=14)
Accepted by Classmates									
Very well	10	4	8	3	4	2	5	2	9
Well	2	1	2	2	2	2	0	1	5
Average	0	2	1	2	1	0	1	0	0
Poor	0	0	0	0	0	0	0	0	0
Very poor	0	0	0	0	0	0	0	0	0
N.A.*	1	–	–	–	–	–	–	–	–
Academic Performance									
Very well	4	2	2	1	3	0	3	1	5
Well	5	0	2	1	2	3	1	1	4
Average	3	4	7	4	2	1	1	1	3
Poor	0	1	0	1	0	0	0	0	2
Very poor	0	0	0	0	0	0	1	0	0
N.A.*	1	–	–	–	–	–	–	–	–
Graduated									
Yes	4	3	4	7	5	0	0	–	–
Not†	9	4	7	0	2	4	6	–	–

* N.A. = No answer.

† Includes two deceased and two who left school. Remainder were still enrolled.

lyzed in terms of the students' academic performance and relationship with peers, no specific problems appeared for any particular category. In fact, very few problems were seen either in the academic or in the interpersonal realm. Of the 72 students reported, 40 did "well" or "very well" academically, and 64 did "well" or "very well" interpersonally. Only five students did "poorly" or "very poorly" academically (Table 1).

When asked whether the schools had any administrative problems providing an adequate education for the physically disabled students, respondents at 19 schools felt that there have been none. Eleven of those schools indicating that there were some problems dealing with the physically handicapped students reported that providing extra emotional support was the most important concern. Three other reported concerns were: providing extra academic support, nine schools; changing faculty attitudes, seven schools; and changing the physical plant, six schools. Respondents at six of the schools indicating a need to change faculty attitudes also expressed a need for extra academic support. Only one school reported a need to change student attitudes. Respondents at two of the schools expressed a need to purchase special equipment, such as a standing wheelchair, for the student to perform adequately in surgery. The five students who had done poorly academically were from five schools which had admitted an average of 3.6 physically disabled students. One student was in a school which indicated a need for more academic support, one in a school needing a change in faculty attitudes, and one in a school needing to administer to both concerns. The other two schools did not report any problems administratively with admitting the physically handicapped student.

Discussion

Once a school has accepted a handicapped student, results of the study show that the school has tended to accept more students with physical disabilities. This suggests that such students may be more willing to apply to schools where there are already physically handicapped students and/or that such schools have had positive experiences and are willing to accept more handicapped students. These schools are also generally older and have a larger student body and thus may have had more opportunities for exposure to physically disabled house staff and faculty members and more knowledge of the capacity of the physically disabled to function under the physical demands of medicine.

As shown, most of the handicapped students have done well academically. However, as more physically handicapped students are admitted and schools become more comfortable accepting students who might be slightly more at risk academically, the chances of academic problems may increase.

A majority of the schools reporting a need to provide extra academic support for their physically disabled students also indicated a need to change faculty attitudes; this suggests that academic performance is a result of a complex of factors, including student performance, faculty perceptions of student performance, and support from the medical school. The fact that so few students did poorly academically, therefore, might testify to the institutional adaptation as well as to the student capability. The need to provide extra emotional support for the individual handicapped students, however, indicates that, although these students function well academically, there was a certain amount of stress with which they had to deal.

Responses to the survey indicate issues that must be addressed regarding the admission and training of physically handicapped students in medicine. However, based on the results of this study, it can be predicted that those handicapped students accepted to medical school are capable of handling both the physical rigors and academic pressure of medical education without compromising the standards of medicine. If there is a toll, either for the student or for the school, this is not readily apparent.

References

1. Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance. *Fed. Regist.*, **42**:22676–22684, 1977.
2. HARTMAN, D., and HARTMAN, C. Disabled Students and Medical School Admissions. *Arch. Phys. Med. Rehabil.*, **62**:90–91, February 1981.
3. MARSLAND, E. A. Reflections of a Disabled Professional. *Physiotherapy*, **67**:97–100, April 1981.

Vol. 58 No. 1 January 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

AAMC Annual Meeting

The Social Determinants of Political Change
Alan Pifer

Can an Invisible Hand Palpate the Carotid Pulse?
Sherman M. Mellinkoff

Flexner and Research Awards

Predicting Performance During Clinical Years from the New Medical College Admission Test
Jan D. Carline, Thomas J. Cullen, Craig S. Scott, N. Fred Shannon, and Douglas Schaad

Baccalaureate Preparation for Medical School: Does Type of Degree Make a Difference?
Carter Zeleznik, Mohammadreza Hojat, and Jon Veloski

The Extent of Volunteer Faculty Integration in Teaching Hospital Settings
Jesse Simon and David Zippin

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 1 • January 1983

AAMC Annual Meeting

The Social Determinants of Political Change—Alan Pifer 1
Can an Invisible Hand Palpate the Carotid Pulse?—Sherman M. Mellinkoff 8
Flexner and Research Awards 13
Predicting Performance During Clinical Years from the New Medical College Admission Test—Jan D. Carline, Thomas J. Cullen, Craig S. Scott, N. Fred Shannon, and Douglas Schaad 18
Baccalaureate Preparation for Medical School: Does Type of Degree Make a Difference?—Carter Zeleznik, Mohammadreza Hojat, and Jon Veloski 26
The Extent of Volunteer Faculty Integration in Teaching Hospital Settings—Jesse Simon and David Zippin 34
Early Outreach: Career Awareness for Health Professions—Susan V. Lourenço 39
A Study of the Information-Seeking Skills of Medical Students and Physician Faculty—Debra A. DaRosa, Terrill A. Mast, Beth Dawson-Saunders, John Mazur, Don E. Ramsey, and J. Roland Folse 45
Identifying the Content of Family Medicine for Educational Purposes: An Empirical Approach—Charles P. Friedman, Lisa M. Slatt, Richard M. Baker, and Sarah B. Cummings 51
Communications: Changes in Medical School Applicant Preparation and Admission Requirements in the Behavioral Sciences—Joseph Stokes, III, and Michael Martin 58
Medical School Education in Hypertension Management: A National Survey—Marvin Moser, David W. Rowden, David Richardson, and Harriet Dustan 60
Effect of Residents' Use of Laboratory Tests on Hospital Costs—John L. Boice and Maurice McGregor 61
Ambulatory Care in Medical Residency: Integration of Private Practitioner's Office with Traditional Sites—Susan Bane and Teri Criscione 64
Effectiveness of the Gynecology Teaching Associate in Teaching Pelvic Examination Skills—Susan M. Guenther, Douglas W. Laube, and Sandra Matthes 67
Briefs 69
Editorial: Animals in Biomedical and Behavioral Research 71
Datagram: Physician Faculty Involvement in Research 73
Book Review 77
Bibliography 80
Letters to the Editor 85

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Mark S. Levitan, *University of Pennsylvania**
Robert Frank, *Barnes Hospital*
Earl J. Frederick, *Children's Memorial Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

COMMUNICATIONS

Changes in Medical School Applicant Preparation And Admission Requirements in the Behavioral Sciences

Joseph Stokes, III, M.D. and Michael Martin

During the last 15 years a steady growth of knowledge in the social and behavioral sciences contributing to the practice of medicine has taken place (1–3). In this paper the authors report changes in behavioral science preparation among applicants to U.S. medical schools and the success of students majoring in behavioral sciences in being admitted. Changes in preparation in the behavioral sciences required by medical schools are also discussed.

Methods

Data provided by the Association of American Medical Colleges (AAMC) regarding the undergraduate baccalaureate majors of applicants to U.S. medical schools for 1972–73 through 1977–78 and data from the AAMC's *Medical School Admission Requirements* for 1970–71 and 1980–81 were analyzed. In the latter study, only those 106 medical schools reporting in both years were included in the analysis.

Results

Information on the baccalaureate majors of applicants in 1972–73 and 1977–78 is presented in Table 1. In 1972–73, only 3,243 (9 percent) of the 36,135 applicants had majored in one or more of the five behavioral and social sciences. More students majored in psychology than all the four other disciplines combined. Only 158 majored in anthropology, and even fewer students majored in a discipline ordinarily classified among the humanities. In comparison, 10,741 (29.7 percent) majored in biology; chemistry was the next most popular with 4,376 (12.1 percent of applicants); and the remaining students either undertook a general, premedical major or majored in physics, engineering, or another physical science. The majors of a significant number of students were not known.

Five years later the total number of applicants to medical school increased to 40,569, but the number of students majoring in a behavioral or social science fell to 2,814, which represented only 6.9 percent of all applicants. All the behavioral and social science disciplines shared in this decline except anthropology, in which the number of majors rose from 158 to 192. The number and percent of majors in the humanities also fell over this five-year period to 907 (2.2 percent). Biology assumed an even more dominant role and represented the college major of 37.1 percent of all applicants. Chemistry also maintained its status as the second most popular major. Therefore, by 1977–78, almost half of all applicants either majored in biology or chemistry, while only about one student in 17 majored in a behavioral science. Small as it is, this latter number was still almost three times greater than the number of students majoring in the humanities. Nevertheless, except for sociology, the likelihood of behavioral science majors being admitted to a U.S. medical school improved over the five-year period, according to the data analyzed, and the same held true for humanities majors. By 1977–78, students majoring in the behavioral sciences were as successful in gaining admission to medical school as were those who majored in chemistry. The 192 who majored in anthropology were the most successful of all in gaining admission. All behavioral and social science majors, except for those in sociology, were more successful in being admitted to medical school than were those who majored in biology.

According to information published in the 1970–71 edition of *Medical School Admission Requirements*, only 12 (11 percent) of the medical schools in the United States required their

---

Dr. Stokes is professor of medicine, Section of Preventive Medicine and Epidemiology, Department of Medicine, Boston University School of Medicine, and Mr. Martin is a third-year student at the University of California, San Diego, School of Medicine.

TABLE 1

Baccalaureate Majors of Applicants to U.S. Medical Schools

Major	1972–73		1977–78	
	No.	Percent	No.	Percent
Behavioral Sciences				
Anthropology	158	0.44	192	0.47
Psychology	2,313	6.40	2,096	5.17
Sociology	309	0.86	160	0.39
Social Sciences				
Economics	226	0.63	204	0.50
Political science	237	0.66	162	0.40
Humanities	1,281	3.50	907	2.20
Biology	10,741	29.70	15,060	37.10
Chemistry	4,376	12.10	4,783	11.80
Unknown	16,494	45.60	17,005	41.90
Total	36,135	100.00	40,569	100.00

applicants to have completed one or more courses in behavioral sciences. Eleven (10 percent) strongly recommended that their applicants should take one or more such courses; 40 (38 percent) made some mention of behavioral science preparation; and the remaining 43 (41 percent) made no reference to behavioral science preparation. Ten years later the publication revealed that the number of medical schools requiring one or more such courses almost doubled to 21 (20 percent), and the number strongly recommending one or more courses increased to 16 (15 percent). The number of medical schools mentioning behavioral science or making no mention decreased correspondingly. However, despite the trend toward increased requirements, there was considerable flux among the schools. For example, of the 12 medical schools requiring one or more behavioral science courses in 1970–71, by 1980–81 three had downgraded this requirement to only a strong recommendation, and one failed to mention any behavioral science preparation whatsoever. Likewise, of the 11 schools strongly recommending a behavioral science course in 1970–71, only two in 1980–81 had upgraded that recommendation to a definite requirement, six continued to recommend one or more courses, two mentioned such preparation, and one made no mention whatsoever.

Discussion

Medical school admission committees often refer to the fact that they seek applicants with a variety of premedical preparation and experience. At the same time, they have maintained such rigorous admission requirements in biology, chemistry, and the other "hard sciences" that it is difficult for premedical students to select many college courses other than those that are required. Although proficiency in a foreign language has largely been dropped as a requirement, medical schools still value preparation and proficiency in mathematics and physics more highly than they do education in the behavioral sciences or humanities. In view of this fact, it is not surprising that more and more students are majoring in biology and chemistry and that fewer are majoring either in behavioral or social sciences or in the humanities. Nevertheless, it should be of some reassurance to those students who do pursue such atypical majors that their likelihood of gaining admission to medical school appears at least as good as, if not better than, it does for those who major in the hard sciences.

References

1. Hughes, C. C., and Kennedy, D. A. Beyond the Germ Theory: Medicine and the Behavioral Sciences. In *Advances in Medical-Social Sciences.* Julio L. Ruffini (Ed.). New York: Gordon & Breach (in press).
2. Simon, A. The Behavioral and Social Sciences. *Science*, **209**:72–78, 1980.
3. Petersdorf, R. G., and Feinstein, A. R. An Informal Appraisal of the Current Status of "Medical Sociology." In *The Relevance of Social Science for Medicine.* L. Eisenberg and A. Kleinman (Eds.). London, England, and Dordrecht, Netherlands: Reidel, 1980, Pp. 27–45.

Medical School Education in Hypertension Management: A National Survey

Marvin Moser, M.D., David W. Rowden, Ph.D., David Richardson, M.D., and Harriet Dustan, M.D.

The management of patients with primary hypertension remains a significant problem for the medical profession. Current estimates place the number of persons in the United States with definite elevations of blood pressure (diastolic blood pressure [DBP] > 90 mm Hg) at more than 35 million. Hypertension is one of the three most common reasons why adult patients visit physicians and is ranked second only to coronary artery disease as the most serious common medical problem that practicing physicians in primary care see in their practices (1).

In spite of this, however, based upon discussions in 1977 and 1979 between members of the National High Blood Pressure Education Program of the National Heart, Lung, and Blood Institute and representatives of more than 20 academic medical centers in the Midwest and eight in the Northeast, it was apparent that specific programs for education in hypertensive vascular disease have been poorly organized in many centers.

Method and Results

In an effort to determine the level of training in this discipline, a self-administered questionnaire was sent to the chairmen of the departments of internal medicine and to specific physicians known by the authors to be active in the field of hypertension at 114 academic medical centers. Faculty members from 90 centers in 44 states responded after several contacts. Results of this survey indicate that:

1. Only 11 of the 90 medical schools had specific hypertension sections.
2. After completion of four years of medical school, students on the average had received 18 hours of instruction in the management of hypertension. Nineteen additional hours were accumulated after three years in graduate medical education for a total of 37 hours after seven years (Table 1).
3. Undergraduate medical students spent only a short period of time (an average of 1.5 weeks) in clinics designated as hypertension clinics, and the average number of students involved per school at any one time was small—three per school.

There was little continuity of care. Even when the hours of informal teaching time, that is, ward rounds, case presentations, and general medical clinics, were included, it appeared that curriculum content was limited.

Discussion

The disparity between hospital and medical school training in hypertension and the problems that a physician faces in practice is one that should be emphasized to medical educators. The fact that only a few students or house staff members are exposed to specific treatment problems in an outpatient setting and that the time they spent with these problems is short also suggests a need for a reevaluation of training in hypertension management. Although some institutions responding to the survey noted that hypertensive patients were followed in general medical clinics and that a large number of residents were involved in their care, the authors, based on their experience, believe

---

The study reported here was jointly sponsored by the American College of Cardiology, the American College of Physicians, and the American Heart Association.

Dr. Moser is clinical professor of medicine, New York Medical College, Valhalla; Dr. Rowden is deputy project manager, National High Blood Pressure Education Program, National Heart, Lung, and Blood Institute, Bethesda, Maryland; Dr. Richardson is chairman, Division of Cardiology, Medical College of Virginia, Virginia Commonwealth University, Richmond; and Dr. Dustan is director of the Cardiovascular Research and Training Center, University of Alabama in Birmingham School of Medicine.

TABLE 1

Distribution of Training Time in Management of Hypertension by Type of Setting and Placement in the Curricula of 90 Academic Medical Centers, 1980

Placement in Curricula	No. Responding	Average Hours by Setting				Average Hours All Settings
		Lecture	Seminar/ Workshop	Clinic	Other	
Undergraduate						
1st Year	32	1.50	0.22	0.84	0.28	2.8
2nd Year	81	1.93	0.79	0.33	0.05	3.1
3rd Year	75	1.44	0.51	2.64	0.23	4.8
4th Year	50	0.94	0.68	5.28	0.48	7.4
Graduate						
1st Year	61	1.98	0.39	2.57	0.18	5.1
2nd Year	59	1.91	0.51	4.05	0.22	6.6
3rd Year	52	1.92	0.58	4.37	0.25	7.1

that training in the management of a chronic illness in these clinics is relatively poor in many cases.

Hypertension in most cases can be controlled with appropriate medication. It is a model of a chronic disease for which medication must be continued for the life of a patient and where numerous problems relating to adherence to therapy must be addressed. Given this factor plus the high prevalence of hypertension, it seems reasonable to expect that a more systematic approach to teaching the management of hypertension in medical schools and teaching hospitals might be considered. However, within the current framework of clinical training in undergraduate and graduate medical education, there appears to be no adequate mechanism for a majority of future practitioners to learn the necessary skills for the long-term management of hypertensive patients.

Based on the responses of the 90 academic medical centers, it is apparent that formal teaching time in the management of hypertension at both the undergraduate and graduate levels is limited, only a few specific facilities are available for training in long-term hypertension management, and an increased emphasis should be placed on the management and training of hypertension management within existing general medical and hypertension clinics.

Reference

1. *Diagnosis and Management of Hypertension/A Nationwide Survey of Physicians' Knowledge, Attitudes, and Reported Behavior* (DHEW Publication No. [NIH] 79-1056). Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1979.

Effect of Residents' Use of Laboratory Tests on Hospital Costs

John L. Boice, M.D., and Maurice McGregor, M.D.

It is generally recognized that university teaching hospitals are more expensive to operate than nonteaching hospitals (1). Many reasons for the difference have been postulated. One widely held belief is that interns and residents in training "overinvestigate" the medical problems which they face. Several attempts have been made to estimate the magnitude of this

---

Dr. Boice is an assistant professor of medicine, and Dr. McGregor is a professor of medicine, McGill University, Montreal, Canada.

Vol. 58 No. 2 February 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

AAMC Annual Meeting

The Changing Economic Environment
R. T. McNamar

Sustaining Human Values
William Raspberry

An Innovation in Physician Training: The Clinical Scholars Program
Annie Lea Shuster, Leighton E. Cluff,
M. Alfred Haynes, Edward W. Hook,
and David E. Rogers

Writing Courses in American Medical Schools
Robert E. Bjork and Robert K. Oye

Decision-Making Among Emergency Room Residents: Preliminary Observations and a Decision Model
Jonathan D. Quick, Gregory Moorhead,
James C. Quick, Edwin A. Gerloff,
Kenneth L. Mattox, and Charles Mullins

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 2 • February 1983

AAMC Annual Meeting

The Changing Economic Environment—R. T. McNamar 87

Sustaining Human Values—William Raspberry 93

An Innovation in Physician Training: The Clinical Scholars Program—Annie Lea Shuster, Leighton E. Cluff, M. Alfred Haynes, Edward W. Hook, and David E. Rogers 101

Writing Courses in American Medical Schools—Robert E. Bjork and Robert K. Oye 112

Decision-Making Among Emergency Room Residents: Preliminary Observations and a Decision Model—Jonathan D. Quick, Gregory Moorhead, James C. Quick, Edwin A. Gerloff, Kenneth L. Maddox, and Charles Mullins 117

Transfer of Student Learning in Medical Education—Vimla L. Patel and Patricia A. Cranton 126

Dermatologic Practice: Implications for a Primary Care Residency Curriculum—William T. Branch, Jr., Martha Collins, and Bruce U. Wintroub 136

Communications: **Medical Students' Attitudes Toward Learning and Learning-Related Skills: A Four-Year Study**—Janet Konefal and Eugene F. Provenzo, Jr. 143

An Evaluation of a Computerized Exercise in Teaching Cost Consciousness—Stephen R. Smith 146

Effectiveness of Medical Consultation—Lawrence E. Klein, Richard D. Moore, David M. Levine, and Susan Kirby 149

Occupational History-Taking in a Family Practice Academic Setting—Raymond Y. Demers and Steve J. Wall 151

Evaluation of Physicians' Requests for Autopsies—Richard W. Kesler, Vernon Maxa, and Frank T. Saulsbury 153

Editorial: Medical Students' Attitudes: Whose Responsibility? 156

Bibliography 158

Letter to the Editor 163

Officers of the Association and Members of the Executive Council, 1982-83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Mark S. Levitan, *University of Pennsylvania**
Robert Frank, *Barnes Hospital*
Earl J. Frederick, *Children's Memorial Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

An Innovation in Physician Training: The Clinical Scholars Program

Annie Lea Shuster, Leighton E. Cluff, M.D., M. Alfred Haynes, M.D., Edward W. Hook, M.D., and David E. Rogers, M.D.

Abstract—The Robert Wood Johnson Foundation Clinical Scholars Program was developed to allow selected physician clinicians to acquire certain skills which are not part of the usual physician's repertoire. Begun in 1969 with support from the Carnegie Corporation and the Commonwealth Fund, funding has been provided since 1973 by the Robert Wood Johnson Foundation. By June 1981, 309 physicians had completed their training as clinical scholars, and a majority were pursuing careers in academic medicine. This paper recounts the factors and forces which led to the initiation and development of the program, its successes and failures, the problems faced, the achievements of clinical scholar alumni, and the program's current status.

Because of the rapidly expanding body of medical knowledge, a changing society, and the demands placed on medical practice, there have been many modifications in medical education and training over the past several decades. The training programs sponsored by the National Institutes of Health for physicians to strengthen medical research, the integration of premedical collegiate and medical school education, and the creation of ambulatory and community-based programs to train both undergraduate and graduate physicians have all represented efforts to keep pace with the changing times.

The Robert Wood Johnson Foundation Clinical Scholars Program was developed to allow selected physician clinicians to acquire certain skills which are not part of the usual physician's repertoire (1, 2). This program focuses on certain nonbiological sciences that have increasing relevance to medical care, medical practice, and medical research. The emphasis has been varied, but it has included disciplines that permit better understanding of the demographic, epidemiologic, economic, social, organizational, humanistic, anthropological, cultural, and ethical problems which face physicians, medical practice, and the broader society in which medical care is administered.

In this paper the authors recount the factors and forces that led to the initiation and development of the program, its successes and failures, the problems faced,

---

Mrs. Shuster is a program officer and Dr. Cluff is executive vice president of the Robert Wood Johnson Foundation, Princeton, New Jersey; Dr. Haynes is dean of the Charles R. Drew Postgraduate Medical School, Los Angeles, California; Dr. Hook is professor and chairman, Department of Medicine, University of Virginia School of Medicine, Charlottesville, Virginia; and Dr. Rogers is president of the Robert Wood Johnson Foundation. Dr. Haynes was formerly chairman and Dr. Hook is currently chairman of the Advisory Board of the Clinical Scholars Program.

and the achievements of the clinical scholars who have completed the program. It was not necessarily the authors' intention to encourage or stimulate its replication but rather to examine the processes involved in beginning and developing a totally new venture in physician training. The authors believe the lessons learned may have general importance for those contemplating or developing other new training efforts in the future. From late 1979 to mid-1981, members of the foundation staff and members of the program's advisory board undertook an intensive review of this foundation effort. This article is based on the report which resulted from that process.

Historical Background

In the mid-1960s, there was a growing awareness that many Americans did not have ready access to medical care. There was increasing concern about the cost and financing of health care, about the availability of certain types of physicians, and about the gap between advances in medical knowledge and technology and the way medical care was provided to most Americans. In addition, in the latter half of the 1960s and in the early 1970s, many medical students and physicians in residency training were deeply concerned about social issues and urged medical schools and teaching hospitals to assume more responsibility for meeting local and regional health care needs of the severely underserved.

In response to these concerns, the federal government initiated several major programs. Most important were: (*a*) Medicare and Medicaid (1965), designed to increase access to medical services and to bring the elderly and the indigent into the mainstream of a single system of personal medical care; (*b*) the regional medical programs created by the Heart Disease, Cancer, and Stroke Amendments (1965) and designed to better link medical schools and teaching hospitals with medical practitioners and community hospitals in planning and coordinating medical services and health education; (*c*) the Office of Economic Opportunity Health Centers Program, established to improve community-based medical care in areas of poverty; (*d*) the Community Mental Health Centers Act (1963 and 1965), which sought to improve access to mental health services; and (*e*) the Comprehensive Health Planning and Public Health Service Amendments (Partnership for Health Act, 1966), developed to rationalize the deployment of health programs and facilities.

In 1965 the Carnegie Corporation, the National Institutes of Health, and the Richard King Mellon Foundation sponsored the Endicott House Summer Study on Medical Education (3) to examine how changes in the education of physicians might improve medical care. The Carnegie Corporation and the Commonwealth Fund subsequently sponsored and funded the Exploratory Conference on Medical Services and Medical Education held February 1966 in Fort Lauderdale, Florida, the Swampscott Study on Behavioral Science in Medicine in November 1966 (4), and a conference on internship and residency training for physicians in April 1967 also held at Swampscott, Massachusetts.

Following the latter Swampscott conference, a group of professors of medicine from five medical schools (Case Western Reserve, Duke, Johns Hopkins, McGill, and Stanford) held a series of meetings with the Carnegie Corporation and Commonwealth Fund staffs. This resulted in the preparation by the five institutions of a joint application to these two foundations for funds to try some new approaches to train a group of academically oriented medical residents in quite nonconventional ways. Of critical import to the plan was the use of the parent universities as a means of access to the "nonbiological disciplines," and the two foundations agreed to support the proposed project (5).

In 1969 funding was provided by the two foundations for a planning and initial implementation phase, and by 1971 training programs in the five institutions were launched. They were described as fellowship programs to establish the field of health services research as a serious discipline within clinical medicine. This statement of the program's purpose represented a more limited approach than the plan conceived in 1968–69. The early proposal identified undergraduate students through practitioners as potential participants in this program.

The Robert Wood Johnson Foundation emerged as a large national philanthropy in 1972. As its initial mission, it elected to support and encourage programs (*a*) to improve access to general out-of-hospital medical care, (*b*) to improve the quality of that care, and (*c*) to develop better data and information needed for the formulation of national health policy. The foundation's familiarity with the training program begun with Carnegie Corporation and Commonwealth Fund support led to a decision by the foundation to strengthen and continue it. Accordingly, in October 1972 the Robert Wood Johnson Foundation Clinical Scholars Program was formally initiated. Positions as clinical scholars were to be open to physicians in residency training in all clinical disciplines. A national advisory board was appointed to review applications and to monitor the progress of the program.

Over the ensuing years the program has been increasingly formalized. Regular reviews of institutional programs are conducted, and their progress toward a stated set of objectives is evaluated. The number of scholars entering the program has been reduced to 20 per year, and the advisory board now participates in their selection. A carefully planned annual meeting of all clinical scholars, many alumni, selected outside speakers, and advisory board members permits regular presentation of work.

Present Status

The Clinical Scholars Program has as its goal the training of clinicians in nonbiological areas bearing on health and health services management, research, and policy for leadership roles in personal health care. It is expected that graduates of the program will be clinically competent, well versed in certain nonbiological fields, and skilled in research, and it is hoped that they can better contribute to improving personal health care in the United States.

Institutions now participating in the Clinical Scholars Program are the University of California, Los Angeles; University of California, San Francisco/Stanford University (joint program); University of North Carolina, Chapel Hill; University of Pennsylvania; University of Washington, Seattle; and Yale University. The institutional programs adhere to the national program's objectives, but their areas of emphasis vary. Health services research and disciplines such as economics, statistics, sociology, and epidemiology figure importantly in all programs. Only two programs, however, stress health services research as the principal or coprincipal area of emphasis. Other programs emphasize, in addition to health services research, one or more of the following areas of inquiry: clinical epidemiology, research on medical practice, health services management and administration, health policy, ethics, and medical school curriculum development.

The Clinical Scholars Program now affords its participants a full-time, two-year fellowship experience. In most programs, a scholar's experience begins with core course work and much of his first year may be devoted to academic study preparatory to launching an independent research program. At one institution this consists of an intensive six-week experience, while at a second institution this is a three-month series of seminars and independent study. At another institution, the main courses in the curriculum extend throughout the scholar's first year, and other components of the curriculum extend into or through his second year.

The scholars have an opportunity to augment their core curriculum work and other basic studies with elective academic courses in the graduate and professional schools of the university. They may undertake formal or informal study in disciplines such as social and policy studies, public health, management and administration, ethics, and the humanities.

Though not required, the scholars frequently elect formal graduate degree work in most of the institutions housing a Clinical Scholars Program. Thus, master's degrees in public health or administration or management sciences are not uncommon. A limited number of clinical scholars work toward doctoral degrees during the two-year period.

Each of the institutional programs provides for weekly seminars, journal clubs, lectures, and program administrative sessions. These offer important opportunities for peer review and faculty-scholar exchange. Most often, the seminars are research-oriented and feature presentations by the scholars of their research proposals, progress, or results.

An original research project is a requirement to be met by every clinical scholar. Academic preparation for and detailed planning of the research project occupy the scholars during their first year. In all programs, the scholars plan their research in consultation with a research adviser; in most programs, the program director or an associate or assistant is also involved in the planning of a scholar's research. Other programs require that an advisory group consisting of a program director, selected clinical and nonclinical faculty members, and the research adviser take part in this process. Approval of a scholar's research proposal in some programs is granted by the research adviser and/or the program director, but in others it is dependent upon a decision rendered by the scholar's advisory group, the program's research advisory committee, or the faculty members affiliated with the program. In still other programs, the scholars are expected to present their research proposals in seminars or committee sessions to their peers and/or the program staff and faculty.

Throughout the two years, all of the scholars devote 10 to 20 percent of their time to the clinical practice of their specialty or subspecialty. Many scholars have undertaken clinical responsibilities related in some way to their research projects.

The scholars are expected to meet high academic standards, to demonstrate excellence in their particular areas of endeavor, and to acquire and maintain credentials which will qualify them for subsequent career appointments.

The program directors are a critical force in the program. All hold full-time academic appointments in clinical departments of medicine (and often in schools of public health). Three program directors are alumni of the Clinical Scholars Program.

Each institutional program is overseen by a formal or informal group of members of the program staff and of the university faculty and administrators. Usually, the programs have a formal advisory committee of individuals drawn from the program's staff and core faculty, pertinent clinical and nonbiological departments, affiliated clinical or research institutes, and medical center and university administration. These groups review policy matters important to the program, monitor the scholars' progress and research, oversee program operation and development, conduct program review, and participate in the evaluation of clinical scholar applicants.

The annual clinical scholars scientific meeting has assumed increasing importance in the program. A committee on arrangements, comprised of representatives of the program directors and the advisory board, plans the format and content of the meeting. Abstracts submitted by the scholars are reviewed, and papers are selected by the committee for presentation at the meeting.

The 12-member advisory board, which is headed by a chairman selected from members of the board, submits policy recommendations affecting the program to the foundation, and it advises on the general organization and structure of the program. Members of the board periodically make site visits to the institutional programs and regularly assess the programs. The board also has made recommendations to the foundation about the selection of institutions as bases for the Clinical Scholars Program and continues to advise the foundation about the renewal and funding of the institutional programs at regular intervals. Each year the advisory board reviews the applications for positions as clinical scholars and recommends applicants for appointment.

The institutional programs maintain strong ties with the Veterans Administration (VA) medical centers affiliated with their universities, and a number of fellows sponsored by the Clinical Scholars Program and fellows sponsored by the Veterans Administration base their research and clinical activities at the VA hospitals. Most of the institutional programs establish ties with local community hospitals, prepaid health plans, and health agencies, which also serve as bases for the scholars' research and clinical efforts. Special institutes of the universities can offer the scholars opportunities for advanced study, training, and research in areas such as health services research, health policy analysis, bioethics, and health economics; all institutions have or are closely affiliated with at least one health services research center, two have institutes for social and policy studies, two are allied with formal ethics programs, one has an institute for health economics, and one sponsors programs in health education and rural health care delivery.

The program offers the clinical scholars an emphasis on epidemiology and biostatistics, health services research, and primary health care delivery. Strong emphasis also is placed on the social sciences. Health economics and management are given attention in the majority of programs, and most programs direct their scholars toward an especially wide range of research and study opportunities in the universities' schools of business administration, where training is offered in management, marketing, economics, administration, and accounting. Health policy receives attention in all programs.

Recruitment and Selection

Dissemination of information about the Clinical Scholars Program and the process for application and selection is a joint endeavor by the institutional programs and the Robert Wood Johnson Foundation. At least every other year the foundation distributes brochures and posters describing the program to clinical department chairmen and deans of all medical schools, teaching hospital directors, and others who may be in a position to advise physicians in residency training. Foundation staff members respond to approximately 500 inquiries annually as a result of this process. In addition, several institutional programs make their brochures widely available.

The clinical scholars are chosen in a national selection process by the advisory board, but the institutional programs also are responsible for recruiting, screening, interviewing, and ranking the applicants. Application to the Clinical Scholars Program is usually made through the institutional program(s) that can best accommodate the applicant's intended course of study, clinical work, and research.

The program has broad minimum criteria for applicants: (*a*) applicants must be persons of high personal and professional integrity and regarded as excellent physicians by the directors of their clinical training programs; (*b*) applicants must have completed a minimum of two years of post-M.D. clinical training and must intend to finish their training if they have not done so prior to application (the program no longer permits concurrent participation in the Clinical Scholars Program and residency training); and (*c*) applicants must provide a statement of purpose, goals, and objectives and indicate that their career commitment is consistent with the objectives of the Clinical Scholars Program. Other highly desirable qualifications are: (*a*) demonstration of an interest in the medical care system; (*b*) the ability to develop and implement new ideas; (*c*) evidence of leadership capabilities; (*d*) effective communication abilities; (*e*) previous research experience; and (*f*) a record of consistent accomplishment.

The process by which clinical scholars are selected is initially based in the institutional programs. The program director or the program staff makes the initial contacts with prospective applicants. This preliminary, screening interview serves two purposes; it allows the program director to determine whether the person qualifies for and would be best served by the Clinical Scholars Program, and it acquaints the prospective applicant with details of the program. Individuals who do not appear to be eligible for the program are apprised of other, more appropriate fellowship opportunities.

Qualified applicants are invited to make formal application to the Clinical Scholars Program; some programs may require candidates to complete a second, more thoroughgoing interview at the institution before they file an application. Because applications are often completed only after these preliminaries, most are rather well developed proposals for study and research in specific areas under the tutelage of particular faculty members.

In the final phase of the selection process, the applications of candidates are evaluated by the program's advisory board. Careful attention is paid to the institution's assessment of and interest in a candidate. The advisory board's decisions are discussed with the institutional program directors before final recommendations on scholar selection and placement are made.

More than two-thirds of the U.S. and Canadian medical schools have graduates who have completed the Clinical Scholars Program. However, a review of the successful candidates shows that a majority of them had had some previous training at the institution where they undertook their training as clinical scholars. This is attributable to several factors: (*a*) understanding the program's focus is enhanced by interaction with current and former scholars; (*b*) many applicants accept residency positions at institutions with clinical scholars programs because of their interest in the program; and (*c*) there is a lack of awareness of the program's broad range of opportunities by those residents in institutions without the program.

Evaluation

The impact of the Clinical Scholars Program on the medical care system of the

United States is best measured in terms of the accomplishments and careers of its alumni. Alumni of the program represent most clinical specialties (Table 1) and have settled in 33 states, the District of Columbia, and Canada. Between 1971 and 1981, most of the 309 graduates of the program moved into positions of leadership and responsibility in academic medicine, clinical practice, government, and health services management, education, and research. A majority of the alumni (178 or 57.6 percent) were involved in the mainstream of academic medicine, having accepted full-time academic appointments in university departments of medicine, pediatrics, psychiatry, family medicine, and other clinical specialties. Many of these graduates assumed major managerial responsibilities in patient care programs of their universities' medical centers. A total of 116 scholar alumni—65 percent of those who entered academic medicine—were appointed to the faculty of the universities at which they studied and worked as clinical scholars or by one of the other schools which were sponsoring or previously had operated a clinical scholars program.

While virtually every graduate of the Clinical Scholars Program was involved to some extent in clinical work, 81 (26.2 percent) of the alumni chose to pursue almost exclusively clinical careers in their specialty or subspecialty. Some of these alumni held appointments as clinical faculty at nearby university medical centers.

TABLE 1

Medical Specialties of 1971–1981 Clinical Scholars Program Alumni

Specialty	No.	Percent
Internal medicine	159	51.5
Pediatrics	75	24.3
Psychiatry	24	7.8
Family practice	21	6.8
Surgery	6	1.9
Preventive/occupational medicine	6	1.9
Emergency medicine	6	1.9
Obstetrics-gynecology	5	1.6
Other	7	2.3
Total	309	100.0

Full-time positions with governmental agencies were held by 16 alumni (5.2 percent). A number of these graduates were associated with specialty branches of the National Institutes of Health, while others were employed by federal or state policymaking, planning, or regulatory bodies.

Of the 34 graduates (11 percent) whose careers may be classified as "other," approximately half were enrolled in educational or training programs (for example, specialty or subspecialty residencies, clinical or research fellowships, graduate, or professional degree programs). Other alumni in this category held a variety of professional and administrative positions.

Most graduates of the program have continued some involvement in research; and many, especially those in academic medicine, have been successful in publishing and in obtaining grant support for their work.

In the years since the Clinical Scholars Program was established, it has become increasingly attractive to clinical and social science faculty members, graduate students, and clinical trainees. Most institutional programs now make courses in the formal core curriculum and seminars in the informal curriculum available on a limited basis to interested senior house officers and to faculties in other university departments. It is through the core curriculum and interdisciplinary seminars that the programs promote the interaction of faculty members and trainees in schools of medicine, public health, business administration, and arts and sciences.

The advisory and policy committees of the institutional programs constitute important interdisciplinary communication networks linking schools and departments of the university. These groups concern themselves with issues such as health services research, nonbiological approaches to health problems, and interdisciplinary research and program development generated within the institutions as a result of the Clinical Scholars Program. In addition, the committees do much to create at their institutions an environment receptive to the scholars and conducive to interdisciplinary inquiry on health issues.

Institutionalization of the Clinical Scholars Program has been quite complete at some universities. Courses developed for a program's core curriculum have in some instances been adopted as part of the formal university curriculum. At one school, the Clinical Scholars Program resulted in the establishment of a curriculum and master's degree program in health services research in the school of public health. Research efforts on the part of faculties and clinical scholars have attracted considerable extramural funding to the host institutions. All of the institutions acknowledge that their clinical scholars programs are valuable assets, for the programs have fostered collaboration among faculty members, departments, and schools and have directly and indirectly stimulated new interdisciplinary teaching and research efforts.

The annual meeting of the Clinical Scholars Program, held in the fall, draws together the staffs, current scholars, and alumni of all institutional programs for three days of presentations, workshops, and informal interaction. Members of the program's advisory board and the foundation's board of trustees also attend the meeting and are afforded considerable contact with the program directors, scholars, and alumni.

Table 2 presents a breakdown by general topic categories of the papers presented at the last seven annual meetings, 1975–1981. Approximately half of the papers dealt with subjects in the category of health services research. Papers on epidemiological research were presented with increasing frequency through 1979. Areas such as health policy and ethics have received little attention at the program sessions.

Presentations at the annual meeting in 1975, 1976, and 1977 were limited to current scholars. In 1978 alumni were invited to submit abstracts for a special session, and six papers were selected. From 1979 to 1981 approximately one-third of the

TABLE 2

Topics of Papers Presented at the Annual Meetings of the Clinical Scholars Program, 1975–1981

Topics	1975	1976	1977	1978	1979	1980	1981	1975–1981
Epidemiology	1	0	7	6	8	1	5	28
Ethics	0	0	0	0	2	2	0	4
Health policy	5	0	1	0	0	0	2	8
Health economics	2	2	4	4	4	3	1	20
Health services research	12	7	12	18	16	24	17	106
Anthropology/ sociology	2	0	0	4	5	1	2	14
Management	0	0	0	1	0	1	0	2
Clinical decision analysis	2	2	0	0	1	2	7	14
Education	1	1	3	0	3	1	2	11
Total papers presented	25	12	27	33	39	35	36	207

presentations were made by former clinical scholars.

Discussion

The Clinical Scholars Program was born, in part, because of increasing concerns about unmet needs in medical care and socioeconomic issues affecting medicine. Many who were involved early in its conceptualization had diverse views about the problems to be addressed and the purposes and training strategies or objectives of the program. Each of these individuals recognized the forces at work in the 1960s and shared a common view about a need to develop new paths for some physicians so that they might effect needed changes in medical care and in the education and training of doctors. Some, however, saw only a need to enlarge or modify conventional training programs, while others saw a need to develop an entirely new training program. As the Clinical Scholars Program began and as it was reviewed after a brief period of planning and implementation, a focus upon health services research training for physicians emerged, and programs which had not developed this focus were terminated. As the Robert Wood Johnson Foundation assumed full responsibilty for the program, emphasis was given to training physicians in the nonbiological or social sciences which seemed relevant to medical care, including economics, sociology, management, law, anthropology, and ethics; epidemiology and biostatistics were the principal research methodologies. Special emphasis was placed upon quantitative studies, and, probably for this reason, subjects such as ethics, history, and the humanities received less attention.

Considerable debate in the early 1970s revolved around whether or not the scholars should become health economists, health administrators, or experts in other social sciences so that they might compete favorably with persons fully trained in those fields. It became progressively clear, however, that such a goal was not achievable, and the intent has become to prepare physicians to work with, communicate with, interact with, and understand those from other disciplines so that the perspective of physicians committed to clinical medicine can be brought to bear on the economic, organizational, management, social, and other nonbiological aspects of medical care.

As might be expected, the Clinical Scholars Program has changed as it has evolved over time. The concept of physician training which it now represents was not precisely articulated in the beginning; the concept emerged as the program matured and those involved in it were able to crystallize its concept. It would be foolish to state that it has now reached a final point in its development. As times have changed, the program also has changed; and the flexible way in which the program has developed makes it probable that it will continue to be modified during the 1980s to direct its attention to new issues and problems. Clearly, the qualitative aspects of medical care, for which methods other than quantitative biostatistics and epidemiology may be required, need increasing attention. The university-wide scope of the Clinical Scholars Program should provide ways to incorporate this or other new areas of attention without the development of an entirely new institutional framework.

Importantly, the Clinical Scholars Program has dealt specifically with improvement of medical care and the contribution physicians could make toward that goal. Thus the program has an opportunity to address contemporary and future issues or problems.

After the program made a small beginning, a very large number of institutions became interested in developing a clinical scholars program and applied for support to implement one. The number of institutions supported expanded very rapidly. In retrospect, this rate of expansion proved to be unwise, as the program had not fully matured and the availability of fully qualified applicants for scholar positions probably was insufficient. Regardless of that, however, some of the first scholars in institutions whose support was subsequently discontinued are now national leaders in examining important health care issues that impact on national policy.

Of necessity, new ways to train physicians must evolve slowly to allow modifications to be made, concepts to be crystallized, and a cadre to be trained who can then populate other institutions. Selecting well qualified trainees in a new program is of obvious importance. Results of the Clinical Scholars Program have shown that the men and women selected fare better if they have reached a certain level of professional competency and maturity. They seem better able to benefit from an innovative experience that is so different from traditional medical education and training programs.

There is no question that the effectiveness of programs like the Clinical Scholars Program is critically dependent upon the role of the leader or preceptor. The leader must be a role model; he must be actively involved, learning, and doing research in the area of the program.

Giving the program a national rather than a local institutional character initially presented problems. Institutions, quite understandably, tended to give preferential consideration to their own applicants for their program. Furthermore, institutions had some difficulty in perceiving themselves as part of a national effort or movement. Various devices have helped to develop a national orientation. A national program director and a nationally representative advisory board helped to create this national character. The establishment of better defined program policies and objectives, involvement of the advisory board in selecting individuals who will be appointed as scholars at each institution, the annual meetings, and the widespread distribution of alumni of the program throughout the country have all contributed to adding a national character to the program. The migration of scholars to institutions where there is not a Clinical Scholars Program has come slowly and is only now accelerating. In the early years it was a natural tendency for scholars to be appointed to the institution where they received their training as clinical scholars.

Some of the programs have encouraged scholars to pursue graduate degrees, but the need for these additional credentials is doubtful. The skills and perspectives scholars are expected to acquire cannot be met simply by obtaining a graduate degree. Formal course work may be necessary, but an emphasis on meeting advanced degree requirements could impinge upon the design and completion of the required research project.

Training programs are difficult to evaluate except descriptively. Innovative programs are usually steadily evolving and changing, and such is the case with the Clinical Scholars Program. The most important outcome is what the graduates of a particular program are doing 10 or 15 years after their training. From this point of view, the Clinical Scholars Program, now at 10 years, seems to be providing the nation with physicians who are working on programs to improve health care, medical education, and training of physicians, and many of the scholars now occupy positions from which they are contributing important work in these areas.

References

1. Feinstein, A. R., and Beck, J. C. The Robert Wood Johnson Clinical Scholars Program. *N. Engl. J. Med.*, **293:**1149–1150, 1975.
2. Inui, T. S. The Robert Wood Johnson Clinical Scholars Program: An Alumnus Report. *Resid. Staff Physician*, 105–114, May 1977.
3. Cope, O., and Zacharias, J. *Medical Education Reconsidered.* Philadelphia: Lippincott, 1966.
4. Cope, O. *Man, Mind, and Medicine: The Doctor's Education.* Philadelphia: Lippincott, 1968.
5. White, K. L. Clinical Scholars and Health Services. *N. Engl. J. Med.*, **283:**930, 1970.

Writing Courses in American Medical Schools

Robert E. Bjork, Ph.D., and Robert K. Oye, M.D.

Abstract—U.S. medical schools were surveyed to determine the extent and nature of instruction in medical writing. Of the 101 schools responding, only 15 offered writing courses. Seven of the 15 offered only brief seminars or workshops. The other eight offered full-term courses (greater than eight weeks or more than 15 hours of instruction). Those not offering courses indicated a need but claimed lack of time, lack of interest on the part of those needing instruction, or lack of qualified faculty members as major reasons for not having the courses. These obstacles can be overcome by designing the writing course to complement existing elements of the curriculum and by soliciting the help of writing specialists on campus.

The quality of medical writing has concerned readers since Henry Oldenburg, secretary to the Royal Society in London, originated the scientific article in the 17th century. When the American Medical Association set up a special committee in 1848 to evaluate the medical literature, that committee found it repetitive, too mundane, and frequently abominably written (1). These problems persist today, and the flow of articles and books on medical writing has been fairly constant since George Gould published his *Suggestions to Medical Writers* in 1900.

Several recent developments have made medical writing even more important. Because of decreasing funds and increasing competition, good writing can make the difference between success and failure both in publishing and in getting grants. Litigation against physicians has also increased, probably, as the Canadian Medical Protective Association recently stated, because of physicians' poor communications skills—oral and written (2). Furthermore, the work of researchers such as Ley on better doctor-patient communication (3) and Becker and Maiman (4) on enhancing patient compliance suggests that physicians need to renew their interest in producing competent, lucid prose; the research also shows the medical value of writing well. As the Association of American Medical Colleges (5) attests in describing prerequisites for a career in medicine, "Refined communication skills—the use and understanding of written and spoken language—are essential, both for the study of medical disciplines and for communication with patients. Effective communication is the foundation of a physician's successful relationship with the public and with other professionals."

Aware of these problems and developments, the Clinical Scholars Program in the School of Medicine at the University of California at Los Angeles (UCLA) in-

---

Dr. Bjork is adjunct lecturer in the writing programs and the Robert Wood Johnson Clinical Scholars Program, and Dr. Oye is a clinical scholar in the Department of Medicine, University of California at Los Angeles UCLA School of Medicine.

stituted a 10-week, two-hour per week writing course in the spring of 1980. The course is a workshop designed for academic physicians and considers the technical features (that is, grammar, syntax, and style) of a variety of prose forms, including some, such as the book review, the patient work-up, and the grant proposal, usually not considered from those perspectives. Similar courses, designed by the same instructor, are also offered in the School of Dentistry and the School of Public Health at UCLA.

To determine how many such courses exist elsewhere and what form those courses typically take, the course instructor surveyed American medical schools about their instruction in medical writing. In this paper the authors present the results of that survey and offer some recommendations based on it.

Methods

Questionnaires were mailed to the deans of all medical schools in the United States in the spring of 1982. A cover letter explained the purpose of the survey and asked the dean or other appropriate individual to fill out the three-page questionnaire about writing instruction in the medical school. Eight weeks after the initial mailing, a follow-up letter and another copy of the questionnaire were sent to all nonrespondents.

The schools were asked whether or not they offered formal courses in medical writing. Where such courses were offered, questions were asked concerning the course structure and format, the level of the participant (that is, medical student, house officer, or faculty member), whether the course was part of a university-wide writing program, and what kind of educational background the instructors had. The course instructors were also asked to indicate which texts they used and to submit sample syllabi if available. Those schools not offering writing courses were asked to specify why they did not and whether they foresaw a need for such a course. To measure potential interest in writing courses, the investigator asked all respondents whether they would like to receive the survey results.

Results

A total of 101 (82 percent) of the 123 schools returned the questionnaires, and 100 questionnaires were suitable for analysis. Fifteen medical schools (15 percent) reported offering a total of 20 medical writing courses, with three schools offering more than one course. Seventeen of the 20 courses were intended for postgraduate-level students, either residents, fellows, or members of the faculty. Two courses were designed for medical students, and one course was offered to promising premedical students. All 20 courses were electives and were created for specific divisions (Table 1). None was intended to be remedial, that is, offering instruction in grammar, punctuation, and spelling. The courses, ranging in class size from two to 15 students, used a combination of workshops and lectures and relied on handouts and student writing samples rather than

TABLE 1

Departments and Divisions Offering Writing Courses in U.S. Medical Schools, 1982

Division	No. of Courses
Interdepartmental	5
Humanities	4
Medical Education	2
Continuing Education	2
Medicine	1
Family Medicine	1
Radiology	1
Physiology	1
Cardiovascular Research	1
Natural Sciences	1
Biomedical Communication	1

on textbooks. Only three instructors required weekly readings from assigned texts.

Seven of the 15 schools described sporadic workshops or short seminars intended principally for the faculty. The remaining eight schools described a total of 13 full-term courses, each providing at least eight weeks or 15 hours of instruction. Twelve of these courses were offered one or more times a year; the 13th course was offered every other year. Ten of the full-term courses were taught by instructors with backgrounds in either English literature or journalism, while the other three were taught by physicians with special interest in writing. Nearly all of the instructors reported having professional editing experience.

Eighty-five schools reported no formal writing courses. Twenty-one of these 85 did not answer the question about the need for writing instruction. Of the 64 schools which did answer this question, 54 (84 percent) acknowledged a need. Several reasons for not developing courses were frequently cited. Thirteen schools mentioned time constraints in a crowded curriculum, five discussed a lack of interest on the part of those needing writing instruction, and five mentioned the lack of faculty members to teach such courses. Though not explicitly asked in the questionnaire, 20 schools not offering formal courses did report a wide range of other writing resources available. Six described writing instruction as being included in existing courses or offered as an occasional lecture. Four schools mentioned specific editorial assistance for those seeking grants or writing for publication. Five schools cited an informal preceptor relationship between senior faculty members and the less experienced writers. Two or three schools referred individuals with severe writing problems to English departments for remedial instruction.

Over 70 percent of the respondents requested the survey results.

Discussion

While the survey revealed few formal courses throughout the country, it did indicate that a large number of medical schools have at least some interest in medical writing, even where no courses now exist. The survey also indicates that those schools that have developed courses have surmounted two main obstacles: (*a*) the lack of curricular time with a related lack of interest among those needing the instruction and (*b*) the lack of qualified faculty members. The structures and goals of the courses already in place can be useful for schools wishing to develop their own writing courses.

The first major problem cited is curricular constraints. Many schools stated that the medical school curriculum is already overburdened, especially at the basic science level; this is one major reason for the near absence of writing courses for undergraduate medical students. Writing courses, however, need not be time-consuming. The existing full-term courses averaged less than 20 total hours of instruction. They can be made even more efficient by coordinating them with existing courses that require some writing, such as research-oriented courses. The major project for both courses can then be the same, as they are for the coordinated writing and research methodology courses in the School of Dentistry at UCLA. This arrangement saves the students time for both courses and can also help demonstrate the integral relationship between writing and research; the higher cognitive functions necessary for research seem to develop most fully through written language (6, 7).

Similarly, short workshops could be tied to other specific writing tasks the student must perform. These workshops could be especially useful in introductory courses to clinical medicine, where students learn to write patient work-ups, because the logic involved in patient assessments should be reflected in the writing. Another workshop can be offered to house officers, who must write research papers or formal case reports as part of their education (8, 9). The workshop then becomes a tutorial, offering expert advice on immediate writing problems. These methods help both to save time and to raise awareness about the importance of writing.

The second major reason cited for not offering medical writing courses was the lack of qualified faculty members. This perception may reflect an old notion about the necessity of scientists teaching scientists. Unfortunately, few physicians are both qualified and interested in teaching a writing course, even when they are good writers themselves. Most of the medical school writing instructors in the country, however, have backgrounds in English literature or composition with additional scientific editing experience. To overcome the perceived faculty shortage, then, medical schools need to be aware that the "literacy crisis" in the past 10 to 15 years has spawned many comprehensive university writing programs; schools wishing to establish writing courses may contact the writing program or English department on campus to arrange for potential instructors (10, 11). Most experienced biomedical editors should be able to design courses which develop writing skills in a medically relevant context. The medical school may also find that the course can be subsidized as part of a university-wide writing program.

The final issue the survey raised concerned instructional materials. Most of the established courses focus on student writing and use other examples of published or unpublished prose to derive the principles of good writing. As students scrutinize their own writing, they can quickly improve weak areas and appreciate strong ones. When, on the other hand, the courses used textbooks, the books were usually recommended but not required. The four texts appearing most frequently on the syllabi were Robert A. Day's *How to Write and Publish a Scientific Paper* (12), Lester S. King's *Why Not Say It Clearly? A Guide to Scientific Writing* (13), Strunk and White's *The Elements of Style* (14), and F. Peter Woodford's *Scientific Writing for Graduate Students: A Manual on the Teaching of Scientific Writing* (15).

References

1. BLAKE, J. B. Literary Style in American Medical Writing: A Historical View. *J.A.M.A.*, **216**:77–80, 1971.
2. WOODS, D. Good English is Good Medicine. *Can. Med. Assoc. J.*, **15**:624–629, 1981.
3. LEY, P. Towards Better Doctor-Patient Communication. In *Communication Between Doctors and Patients.* A. E. Bennett (Ed.). London: Oxford University Press, 1976, Pp. 75–98.
4. BECKER, M. H., and MAIMAN, L. Strategies for Enhancing Patient Compliance. *J. Community Health*, **6**:113–135, 1980.
5. FARLEY, L. (Ed.). *Medical School Admission Requirements, 1982–83.* Washington, D.C.: Association of American Medical Colleges, 1981, P. 8.
6. POLANYI, M. Knowing and Being. In *Knowing and Being: Essays by Michael Polanyi.* M. Grene (Ed.). Chicago: University of Chicago Press, 1969, Pp. 123–137.
7. VYGOTSKY, L. *Thought and Language.* Cambridge, Massachusetts: MIT Press, 1962.
8. PETRUSA, E. R., and WEISS, G. B. Writing Case Reports: An Educationally Valuable Experience for House Officers. *J. Med. Educ.*, **57**:415–417, 1982.
9. FROELICH, R. E., and KIMPTON, R. S. An Experience in Improving Medical Writing: A Staff and Student Workshop-Seminar. *Missouri Medicine*, **64**:325–327, 1967.
10. WIENER, H. Administering Comprehensive Writing Programs Within Liberal Education. *The Forum for Liberal Education*, **3**:1–16, April 1981.

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The Role of a Medical Education Center in Location Decisions of Practicing Physicians
Don Buesching and Michael Glasser

Effect of Immediate Student Evaluations on a Multi-Instructor Course
Paula L. Stillman, Mina A. Gillers, Marilyn Heins, Glen Nicholson, and Darrell L. Sabers

Introducing Preclinical Students to Primary Care Through a Community Preceptorship Program
Daniel S. Blumenthal, Meryl S. McNeal-Steele, Lester L. Bullard, Stephen L. Daniel, and David Satcher

Medical Practice and Genetics in the Mid-Michigan Area
Saroj Kapur, James V. Higgins, Andrea Doughty, and David J. Kallen

Educational Decentralization and Deployment of Physician's Assistants
Virginia Kliner Fowkes, Frederic W. Hafferty, Harold I. Goldberg, and Ronald D. Garcia

Supplement
AAMC Annual Meeting and Annual Report, 1982

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 3 • March 1983

The Role of a Medical Education Center in Location Decisions of Practicing Physicians—Don Buesching and Michael Glasser 165

Effect of Immediate Student Evaluations on a Multi-Instructor Course—Paula L. Stillman, Mina A. Gillers, Marilyn Heins, Glen Nicholson, and Darrell L. Sabers 172

Introducing Preclinical Students to Primary Care Through a Community Preceptorship Program—Daniel S. Blumenthal, Meryl S. McNeal-Steele, Lester L. Bullard, Stephen L. Daniel, and David Satcher 179

Medical Practice and Genetics in the Mid-Michigan Area—Saroj Kapur, James V. Higgins, Andrea Doughty, and David J. Kallen 186

Educational Decentralization and Deployment of Physician's Assistants—Virginia Kliner Fowkes, Frederic W. Hafferty, Harold I. Goldberg, and Ronald D. Garcia 194

Communications: **The Role of the Behavioral Sciences in North American Medical Schools: An Overview**—John L. Arnett and Terrence P. Hogan 201

A Simplified Cost-Finding Methodology—Julia F. Costich 203

Residents' Perceptions of Primary Care Versus Traditional Internal Medicine Programs—Howard K. Wilson, Harold Brown, Steven P. Keuer, Richard P. Permutt, James W. Sawyer, and Edward C. Lynch 205

Trends in Internal Medicine Manpower: A Comparison of Two Data Sets—Harry N. Beaty and David Babbott 207

Problems Faced by New Directors of Internal Medicine Residencies—Gordon L. Noel and James J. Leonard 209

Computer Reporting of Anesthesiologists' Clinical Activity—Betty L. Grundy, Eugene Bobby, and June L. Lorig 211

Editorial: Clinical Judgment of Faculties in the Evaluation of Clerks 213

Book Review 215

Bibliography 217

Letter to the Editor 221

Supplement: AAMC Annual Meeting and Annual Report, 1982 223

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

The Role of the Behavioral Sciences In North American Medical Schools: An Overview

John L. Arnett, Ph.D., and Terrence P. Hogan, Ph.D.

A recent report by Nathan and Allen (1) showed that at least three-quarters of all four-year American medical schools had formally organized programs in behavioral science. On the average, behavioral science has been a formal part of American medical education for the last decade. Yet at some medical schools, it has been a part of the curriculum for nearly 30 years, while at others instruction in behavioral science has just recently been instituted.

Considerable diversity of the course content, curriculum time, and general acceptance of behavioral science appears to exist at American medical schools. In this regard, Begun and Rieker (2) argued that the behavioral sciences occupied an ambiguous position in American medical education and noted that considerable debate existed concerning the organization, content, and acceptance of such programs.

The study reported here was undertaken to assess the situation regarding instruction hours, when the instruction occurs, the curriculum content, and the administrative coordination of behavioral science programs at U.S. and Canadian medical schools.

Method

In early 1980 all American and Canadian deans of medicine were contacted by letter and asked to provide information on their behavioral science instruction programs.

Results and Discussion

Responses were received from 49 American medical schools (39 percent) and eight Canadian medical schools (50 percent), for an overall response rate of approximately 40 percent. In both the United States and Canada, the sample was widely distributed geographically, and no bias was evident in the data concerning medical school size. In the U.S. data, private and public schools were equally represented, while in Canada nearly all medical schools were public institutions.

The mean number of undergraduate behavioral science instruction hours at U.S. medical schools was 89.55 hours (S.D.= 61.81); the median number of instruction hours was 64. In Canada an average of 103 hours (S.D.=125) was allocated during undergraduate medical training for instruction in behavioral science, while the median number of instruction hours was 61. The extreme variability in the Canadian data was largely due to one medical school that reported 370 hours of instruction in behavioral science. Twenty-five percent of the Canadian medical school sample reported that no behavioral science instruction occurred during undergraduate medical training, whereas this was the case in only 2 percent of the U.S. sample. Thus, behavioral science instruction appeared to be much more firmly established in U.S. undergraduate medical education than in Canadian undergraduate medical education. However, even at those U.S. and Canadian medical schools which did provide instruction, some questions arose concerning how significant an impact the typically modest amount of curriculum time was likely to have on students.

Results of the study concerning instruction hours in behavioral science in U.S. medical schools were not entirely consistent with data provided by Nathan and Allen (1), who reported that, on average, 129 hours of instruction were allocated during the typical four undergraduate years of medical school. While it was possible that the discrepancy resulted from

---

Dr. Arnett is assistant professor of psychiatry, Faculty of Medicine, and Dr. Hogan is associate vice president (academic), University of Manitoba, Winnipeg, Manitoba, Canada.

sampling error alone, it appeared that the differing results stemmed from their finding that, on average, 42 hours of instruction occurred during the last two years of medical school, whereas in the study reported here little evidence was found of instruction in behavioral science during this period. Behavioral science and psychiatry curricula become increasingly difficult to distinguish during the last two years of medical school, and hence the present authors may have categorized as psychiatry what Nathan and Allen (1) categorized as behavioral science. In addition to questions of definitions, behavioral science courses were frequently integrated into more general courses (for example, introduction to clinical skills), and this further complicated the calculation of instruction time devoted specifically to behavioral science.

The impact of behavioral science instruction is likely influenced by when it occurs in the curriculum. Of the U.S. medical schools, 40 percent of the sample indicated that instruction was provided in only the first year, 15 percent indicated instruction in the second year only, and 32 percent provided instruction in both the first and second years. In only 12 percent of the U.S. medical schools sampled was it found that instruction in behavioral science occurred in the third and/or fourth years. In Canada 71 percent of the medical schools sampled provided instruction in behavioral science in only the first year, 14 percent provided instruction in the second year alone, and an additional 14 percent provided instruction in the first and second years. In no Canadian medical school sampled was behavioral science instruction offered in the third and/or fourth years.

If the data are accurate in reflecting minimal behavioral science instruction during the senior years of medical school, when students are more clinically active and responsible for patient care, it seems doubtful that some of the clinical aspects of behavioral science (for example, biofeedback, stress management, relaxation training) will be seriously considered as potential therapies either by senior medical students or by practitioners. In the authors' experience, when the behavioral sciences are presented during the preclinical medical years, they are unlikely to be fully appreciated.

TABLE 1

Percent of 58 North American Medical Schools with Selected Topic Areas in Their Curricula

Topic Area	Percent
Human development	60
Mental disorders	50
Human sexuality	35
Behavioral medicine	31
Interviewing	29
Death and dying	24
Substance abuse	21
Aging	17
Psychosocial aspects of illness	16
Stress and stress management	14

Departments of psychiatry were primarily responsible for coordinating the majority (67 percent) of programs in behavioral science at U.S. and Canadian medical schools. Other behavioral science organizational models included interdisciplinary committees (16 percent), autonomous departments of behavioral science (10 percent), and miscellaneous structures (7 percent) (for example, dean's coordinating committee). These results are reasonably consistent with information provided by Fletcher (3).

The diversity in behavioral science course content noted by Fletcher (3) and Begun and Rieker (2) was also evident in the results of the study reported here. In excess of 30 different topic areas were identified even after the various psychological abnormalities were grouped under a single topic area (mental disorders). The data presented in Table 1 show the 10 most frequent topic areas included in the behavioral science curriculum of the sample of U.S. and Canadian medical schools. Human development was the single most common topic area. It was included in the curriculum of 60 percent of the medical schools sampled. It was followed relatively closely by topics on mental disorders (for example, psychoses, affective disorders, personality disorders), which were included in the behavioral science curriculum of half the medical schools.

References

1. NATHAN, R. G., and ALLEN, J. H. Coordinated Behavioral Science Curricula in American Med-

ical Schools: 1980. *J. Med. Educ.*, **57**:401–403, 1982.

2. Begun, J. W., and Rieker, P. P. Social Science in Medicine: The Question of "Relevance." *J. Med. Educ.*, **55**:181–185, 1980.
3. Fletcher, C. R. Study of Behavioral Science Teaching in Schools of Medicine. *J. Med. Educ.*, **49**:188–189, 1974.

A Simplified Cost-Finding Methodology

Julia F. Costich, Ph.D.

An analysis of costs and revenues in the University of Kentucky Department of Family Practice was undertaken in 1981 in order to determine the cost of seeing patients in the model outpatient clinic, the relationship of the volume of patient visits to costs, and the cost of educating residents during a three-year training period.

Previous studies have noted that costs in primary care and family practice training programs never reach a level low enough to be covered by revenues (1–4). Most costs are easily determined by taking the sum of fixed and variable expenses and dividing this figure by the number of visits by patients to the facility. A somewhat more precise figure may be generated by dividing the costs into segments according to the type of health care provider involved (for example, certified medical assistant, registered nurse, resident, or faculty member). This type of study may vary in complexity depending on the needs of those who use the cost-finding information to be provided.

The cost of education is impossible to calculate in any manner that is not arbitrary (5, 6), but a methodology can be derived to yield information that is useful within the limits of its assumptions. The concept of "joint costs" is useful because it indicates the sum of educational and patient care costs generated by a patient visit. By creating averages based on the university's system of reporting time, it is possible to approximate the faculty's distribution of effort, preceptor's time, educational costs, hours of effort by residents, and the costs generated by residents in the outpatient facility.

The following description of the methodology developed in the University of Kentucky Department of Family Practice is based on elementary economic principles familiar to managers and administrators in academic medicine.

The total cost of running a model clinic does not vary significantly with the number of patient visits. Most costs are fixed amounts, such as rent, utilities, personnel costs, and equipment costs. An additional patient visit affects only the smaller items in the total: supplies, billing, postage, telephone, and those allocations made for college and practice plan administration. These items comprise approximately 10 percent of the total cost of a patient visit to the University of Kentucky model clinic. Variable expenses such as those just noted may differ slightly from month to month, depending on the number of visits to the facility.

The analytical technique known as sensitivity analysis is useful to determine the extent to which an increase or decrease in patient volume influences costs. In general, unit costs increase at an increasing rate when patient volume declines, and they decrease at a decreasing rate when volume increases.

Estimates of the cost of resident education depend on the items included in the calculation, since patient visits are not entirely devoted to education or patient care. A range of costs is based on the assumption that between one-third and two-thirds of the average patient visit

---

Dr. Costich is special project officer, University of Kentucky College of Medicine, Lexington.

Trends in Internal Medicine Manpower: A Comparison of Two Data Sets

Harry N. Beaty, M.D., and David Babbott, M.D.

The National Study of Internal Medicine Manpower (NaSIMM) was initiated in 1975 by the Association of Professors of Medicine. The goal of the NaSIMM, endorsed and supported by the Federated Council for Internal Medicine, was "to provide information that could be used to develop policies on the training of internists, the role of internists in primary care, and the specific role of internists in the health care system" (1). As the study progressed, the National Resident Matching Program (NRMP) began to collect data from U.S. medical schools that identified the location and type of program entered by graduates who did not obtain their first-year residency position through the match (2). These follow-up data, combined with the match results, have made it possible to determine the types of first-graduate-year positions entered by essentially all graduates of U.S. medical schools (USMGs). In 1978, with the cooperation of the teaching hospitals, the NRMP began studies that track each USMG beyond the initial year of graduate medical education (3). Thus, since 1978, two manpower studies have been conducted simultaneously: the NaSIMM relating only to internal medicine and the NRMP's match, follow-up, and tracking studies encompassing all specialties.

Comparisons of these two large data sets were likely, even though the perspectives and objectives of the data collectors were quite different. Confusion arose when individuals and organizations interested in internal medicine manpower focused on discrepancies in the numbers of USMG first-year residents reported by the NaSIMM and the NRMP and on the NaSIMM's report that a relatively constant proportion of USMGs were entering first-year residency positions in internal medicine while the NRMP was reporting a gradual but steady decline in this proportion (1, 4).

In the present paper, the authors report the results of an analysis of these data that was undertaken with the assistance of the NRMP and NaSIMM staffs in an effort to determine the degree of congruence of the data and to assess the usefulness of the data to program directors, medical educators, and others interested in internal medicine manpower.

Analysis

NaSIMM and NRMP data on USMG first-year residents were analyzed for the 1977–78, 1978–79, 1979–80, and 1980–81 residency years. Apparent discrepancies between these data sets and further analysis of the discrepancies are summarized in Table 1.

For 1977–78 and 1978–79, the NaSIMM data were extrapolated from a 90 percent response to the questionnaires submitted to the program directors (1). For 1979–80 and 1980–81, the numbers represent the total reported by all programs (1).

In all years, the numbers reported by the NaSIMM represent graduates of U.S., Canadian, and Puerto Rican medical schools (all schools approved by the Liaison Committee on Medical Education) who occupied positions as first-year residents in internal medicine irrespective of the year they graduated. The NRMP data, which include residents in the military, are derived from match results and the annual follow-up studies. In these data, USMGs are defined as graduates of U.S. medical schools who proceed to a first-year residency position in the year the M.D. degree is granted. Thus, the NaSIMM and the NRMP define USMG

The study reported here was sponsored by the Robert Wood Johnson Foundation.

Dr. Beaty is professor and chairman, Department of Medicine, and Dr. Babbott is director, Office of Graduate Medical Education, and associate professor of medicine, University of Vermont College of Medicine, Burlington, Vermont. Dr. Beaty also is chairman of the Association of Professors of Medicine Task Force on Manpower.

TABLE 1

Number of U.S. Medical School Graduates in First-Year Residency Positions in Internal Medicine According to Two Sets of Data

Data Source	1977–78	1978–79	1979–80	1980–81
NaSIMM	5,142	5,320	5,245	5,420
NRMP	4,827	4,985	4,992	5,142
Difference	315	335	253	278
Less adjustments*				
North American graduates	169	152	206	218
"Cross-overs"	†	173	144	†
Adjusted difference	146	10	97	60

* For explanation, see text.

† Data not available.

differently, and this difference has contributed to the apparent discrepancy and confusion between the sets of data. The NRMP (4) separately counts a group of individuals it classifies as North American graduates (NAGs): "graduating students from U.S. osteopathic schools and Canadian medical schools; physician candidates, that is, U.S. graduates who did not enter graduate medical education directly from medical school; and 'fifth pathway' students, who are U.S. nationals who have completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship." These individuals are included in the NaSIMM census as USMGs but are excluded from the NRMP definition of USMGs.

Because of these differences, the number of first-year residents reported each year by the NaSIMM has been greater than that reported by the NRMP. When the differences in the two data sets are adjusted by accounting for NAGs, the differences are decreased substantially. A further adjustment is necessary because the NaSIMM figures include a number of men and women who entered their first-year residency in internal medicine after spending a minimum of one previous year of residency training in another specialty. NRMP tracking studies showed there were 173 such "cross-overs" in 1978 and 144 cross-overs in 1979 (3). These individuals are not included in the NRMP counts of USMGs or NAGs. Thus, for 1978 and 1979 the apparent discrepancy between the NaSIMM and the NRMP of 335 and 253 can be adjusted by subtracting NAGs and crossovers. These adjustments appear in Table 1. When the adjustments are taken into consideration, the congruence between NaSIMM and adjusted NRMP numbers is 99.8 percent for 1978–79 and 98.2 percent for 1979–80. Additionally, the NRMP data do not include a small number of graduates who did not report their postgraduation plans to their medical schools, a somewhat larger but still very small percentage of graduates who did not enter any graduate medical education program, and a very small number who were not accounted for each year. The NaSIMM bases its calculations on the number of graduates of U.S. schools as reported by the Liaison Committee on Medical Education, a number that is always about 200 students larger than that used by the NRMP (4). Thus, in light of the different data bases, slight discrepancies in percentages or trends derived from the two data sets should not cause undue concern.

Conclusion

The potential power of these combined data sources in answering questions about why and when certain career choices are made justifies the full support of medical schools and directors of residency training programs in providing data. However, before the NRMP data set can fully meet the needs of all specialties and subspecialties in analyzing physician manpower, it will have to provide equally accurate data about foreign medical graduates and U.S. citizens who are graduates of foreign medical schools. The NaSIMM has documented that these individuals comprise about 20 percent of internal medicine trainees and, according to the Graduate Medical Education National Advisory Committee report, that proportion will increase in the next decade (5).

References

1. Schleiter, M. K., Tarlov, A. R., and Weil, P. A. National Study of Internal Medicine Manpower: VII/Residency and Fellowship Training, 1976–1977 Through 1980–1981. *Ann. Intern. Med.*, **95**:762–768, 1981.
2. Graettinger, J. S. First-Year Graduate Medical Education Positions Obtained by U.S. Graduates in 1977. *J. Med. Educ.*, **53**:547–555, 1978.
3. Graettinger, J. S. A Tracking Study of U.S. Medical School Graduates from the First to the Second Postdoctoral Year. *J. Med. Educ.*, **55**:647–655, 1980.
4. *NRMP Directory: Including Hospitals and Programs Participating in the Matching Program for 1982 Appointments.* Evanston, Illinois: National Resident Matching Program, 1981, Pp. 15–37.
5. *Summary Report of the Graduate Medical Education National Advisory Committee* (DHHS Publication No. [HRA] 81-651). Washington, D.C.: U.S. Department of Health and Human Services, 1980.

Problems Faced by New Directors of Internal Medicine Residencies

Gordon L. Noel, M.D., and James J. Leonard, M.D.

Each year approximately one out of five program directors of internal medicine residencies is new to that position. Frequently, new program directors are faced with a need to rebuild their programs extensively either because of a perceived deterioration in the quality of their applicants or because of a curriculum which no longer adequately prepares their residents for practice.

In October 1981 two workshops titled "Problems of the New Internal Medicine Program Director" were held by the Association of Program Directors in Internal Medicine in Washington, D.C. The participants were 18 internal medicine program directors, of whom six were at major university hospitals, five were in large affiliated hospitals, and seven were in small community-based affiliated hospitals. Almost all of the program directors identified themselves either as new program directors on the job for only a few months who had inherited troubled programs or as program directors with one or two years of experience in residencies undergoing major changes. The program directors were asked to specify the major problems they faced, and the following were selected for discussion: (*a*) problems created by noninternal medicine residents rotating on internal medicine services; (*b*) development of a curriculum which would adequately prepare residents for practice; (*c*) recruitment of more competent house officers.

The Noninternal-Medicine Rotator

Suggestions for dealing with less able or less interested residents from other departments rotating through internal medicine services included negotiating with the other departments to permit the department of medicine either to co-interview the residents or to have veto power over their selection. In cases where that could not be arranged with the other departments, it was recommended that the department of medicine establish clear guidelines for performance during internal medicine rotations, place noninternal medicine residents on services where evaluations were prompt and accurate, and place residents on probation or ask them to leave the service if their performances as either physicians or educators were inadequate. It also was recommended that the length of rotations be increased beyond the customary one month so that internal medicine skills could be im-

---

Dr. Noel is associate professor and director of educational programs, Department of Medicine, and Dr. Leonard is professor and chairman, Department of Medicine, Uniformed Services University of the Health Sciences School of Medicine, Bethesda, Maryland.

Vol. 58 No. 4 April 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Legal Implications of Clinical Supervision of Medical Students and Residents
Marshall B. Kapp

The Impact of External Examinations on Medical Education Programs and Students
Murray M. Kappelman

The Effect of Regional Medical Education on Physician Distribution in Illinois
David L. Spencer and Gabrielle D'Elia

A Follow-Up Survey of Drug Abuse and Alcoholism Teaching in Medical Schools
Alex D. Pokorny and Joel Solomon

Teaching Medical Students About Substance Abuse in a Weekend Intervention Program
Harvey Siegal and John R. Rudisill

Multiple Strategies for Studying Medical Clerkship Experiences: A Case Study
Lawrence R. La Palio, Constance M. Filling, John D. Engel, and Peter O. Ways

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 4 • April 1983

Legal Implications of Clinical Supervision of Medical Students and Residents—Marshall B. Kapp 293

The Impact of External Examinations on Medical Education Programs and Students—Murray M. Kappelman 300

The Effect of Regional Medical Education on Physician Distribution in Illinois—David L. Spencer and Gabrielle D'Elia 309

A Follow-Up Survey of Drug Abuse and Alcoholism Teaching in Medical Schools—Alex D. Pokorny and Joel Solomon 316

Teaching Medical Students About Substance Abuse in a Weekend Intervention Program—Harvey Siegal and John R. Rudisill 322

Multiple Strategies for Studying Medical Clerkship Experiences: A Case Study—Lawrence R. La Palio, Constance M. Filling, John D. Engel, and Peter O. Ways 328

The Use of Mental Practice in Pelvic Examination Instruction—Phillip G. Rakestraw, David M. Irby, and Louis A. Vontver 335

A Computer-Assisted Teaching System in Pharmacology for Health Professionals—Thomas L. Pazdernik and Edward J. Walaszek 341

Communications: A House Call Teaching Program for Fourth-Year Medical Students—John F. McCahan, Anna M. Bissonnette, and Barbara A. DiRusso 349

Satisfaction with an Internal Medicine Residency Program: Comparison Among Postgraduate Years—Neil J. Farber and Howard A. Miller 351

The Integration of Behavioral Science Theory and Clinical Experience for Second-Year Medical Students—Kathryn M. Taylor, Marla Shapiro, and Merrijoy Kelner 353

Perceptions of Recent Graduates of the Adequacy of Anesthesia Training Programs—Fred J. Spielman and Edwin A. Bowe 355

Editorial: Internal Versus External Quality Control: The Value of External Examination in Medical Education 358

Bibliography 360

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

The Effect of Regional Medical Education On Physician Distribution in Illinois

David L. Spencer, M.D., and Gabrielle D'Elia, Ph.D.

Abstract—Changes in the distribution of physicians among the 102 counties in Illinois in 1969 and 1979 were analyzed. During the decade, the supply of patient care physicians increased from 12,884 to 17,363 (35 percent). The 49 counties with populations of fewer than 25,000 experienced only minimal increases (14 physicians). The state's major population center, the Chicago Standard Metropolitan Statistical Area (SMSA), had a stable rate of increase to maintain its 76 percent of the total patient care physician supply in Illinois. The major change was the increase in physicians in counties with middle-sized cities. The authors relate the changes to the establishment of regional medical education centers in the state and argue that the major result of the program was not a general diffusion of physicians but the concentration of physicians in the tertiary care centers with the new educational programs.

During the 1970s, significant amounts of public and private funding were made available to medical schools and their students and to residency programs and their residents to influence the supply and distribution of physicians in the United States. The decade opened with the judgment that the country faced a shortage of physicians (1). At the midpoint, the emphasis shifted to a specialty and geographic maldistribution (2). By the end of the decade, recommendations about a projected surplus of physicians emerged (3). Researchers have described the diffusion of board-certified specialists (4) and of all physicians (5) into smaller communities. In this paper, the authors explore the relation of initiatives in medical training to the supply and distribution of physicians in Illinois.

Changes in Medical Education

The blueprint for changes in undergraduate medical education in Illinois was the 1968 report, *Education in the Health Fields in Illinois* (6). The changes were designed to address a number of identified problems: the decreasing number of general practitioners, the high median age of the physicians in many counties, the loss to Illinois of a large percentage of the graduates of its medical schools, and the concentration of physicians and health care resources in the Chicago metropolitan area.

One assumption was that decentralizing medical education might lead to a more decentralized distribution of physicians. Thus, the Illinois Health Services Education Grants Act of 1970 permitted the University of Illinois to establish components of its undergraduate medical education program at Rockford, Peoria, and Champaign-Urbana. A new, separately accredited three-year medical school was

---

Dr. Spencer is professor and chairman, and Dr. D'Elia is assistant professor, Department of Family Practice, Southern Illinois University School of Medicine, Springfield.

organized at Southern Illinois University, with the first year of basic medical education in Carbondale and the second and third years of clinical training in Springfield.

The Health Services Education Grants Act also provided support for the regionalization of graduate medical education on the assumption that physicians tend to enter practice near the location of their residency training. From fiscal years 1968 to 1981, the state of Illinois provided over $50 million for capital expenditures alone to medical schools and their affiliated hospitals. Table 1 contains a description of the allocation of those funds.

The state's initiative was paralleled by a major federal contribution. During fiscal years 1965–1977, federal awards of more than $96 million were made to medical schools in Illinois (7). Approximately $60 million went to five private medical schools in Chicago, $27 million to the University of Illinois, and $10 million to Southern Illinois University. These awards were for formula grants (basic improvement, institutional, or capitation grants), special project grants, student loans, scholarships, construction awards, start-up grants, and general internal medicine and general pediatric grants.

TABLE 1

State of Illinois Capital Expenditures for Regional Medical Facilities, Fiscal 1968–1981

Location	University Medical Facilities	Affiliated Hospital Facilities
University of Illinois		
Chicago campus	*	$ 9,521,000
Rockford campus	$ 6,827,000	856,000
Peoria campus	8,350,000	1,823,000
Champaign campus	6,859,000	none
Southern Illinois University		
Springfield campus	12,998,000	6,090,000
Carbondale campus	655,000	744,000
Total	35,689,000	19,034,000

* Not available.

Source: Illinois Board of Higher Education.

One result of these efforts was the regionalization of medical education with new University of Illinois programs in Rockford (with additional clinical sites in Belvidere, Mount Morris, Durand, and Rockton), in Peoria, in Champaign-Urbana (with an additional clinical site in Danville), and in Chicago. Southern Illinois University established its undergraduate program in Carbondale and Springfield and organized residency programs in the major specialties in Springfield. Emphasis on family medicine led to the establishment of family practice residency programs in Springfield, Carbondale, Belleville, Quincy, and Decatur.

Another result was the infusion of sizable amounts of state and federal funds for medical professional training into a number of Illinois cities previously lacking the programs and/or the funding: Rockford, Peoria, Champaign, Danville, Springfield, Carbondale, Belleville, Decatur, and Quincy.

Changes in Physician Supply

What changes in physician supply and distribution occurred during this decade of change in medical professional training? A comparison of data obtained by the American Medical Association (AMA) for physicians in Illinois in 1969 (8) and 1979 (9) provides the basis for addressing this question. In 1969, Illinois had 12,884 physicians in patient care (8). The distribution of physicians throughout the counties of Illinois is presented in Table 2. The AMA data used a demographic county classification scheme of nine categories reflecting the population size and metropolitan-nonmetropolitan location of each county. Metropolitan areas were defined by the AMA using concepts developed by the U.S. Bu-

TABLE 2

Distribution of Patient Care Physicians in Illinois in 1969 and 1979, by Demographic County Classification

Demographic County Classification	Patient Care Physicians		Patient Care Physicians per 100,000 Population	
	1969	1979	1969	1979
Nonmetropolitan counties with under 9,999 inhabitants (14 counties)	30	35	34	35
Nonmetropolitan counties with 10,000–24,999 inhabitants (35 counties)	307	316	53	52
Nonmetropolitan counties with 25,000–49,999 inhabitants (21 counties)	459	550	63	71
Nonmetropolitan counties with over 50,000 inhabitants (Coles, DeKalb, Jackson, Knox, LaSalle, Whiteside, Williamson)	343	425	77	91
Counties considered potential SMSAs (Adams, Vermilion)	147	236	86	137
Counties in SMSAs with 50,000–499,999 inhabitants (Champaign, Decatur, Kankakee, Bloomington, Peoria, Rockford, Rock Island Springfield SMSAs)	1,426	2,142	97	136
Counties in SMSAs with 1,000,000–4,999,999 inhabitants (Illinois counties of St. Louis, Missouri, SMSA)	347	450	60	77
Counties in SMSAs with 5,000,000 or more inhabitants (Chicago SMSA)	9,825	13,209	142	188
Total	12,884	17,363	117	154

reau of the Budget and estimates of service areas based on surveys conducted by a commercial firm. In this AMA scheme, a Standard Metropolitan Statistical Area (SMSA) included a central city of 50,000 or more inhabitants, the remainder of a county containing such a central city, and all the contiguous counties with social and economic integration to the central city (8). The six counties in the Chicago SMSA had 9,825 physicians in patient care. This figure represented 76 percent of all the physicians in the state. Those six counties (Cook, DuPage, Kane, Lake, McHenry, and Will) had 63 percent of the population of Illinois. The four categories of nonmetropolitan counties combined (77 counties) had only 9 percent of the physicians and 17 percent of the population.

Ten years later, in 1979, Illinois showed a net gain of 4,479 physicians in patient care. The number of physicians and the physician-population ratios in 1969 and 1979 are shown in Table 2. How the net gain was distributed among the counties is shown in Table 3. By 1979, metropolitan Chicago had 3,384 more physicians than it had 10 years previously. This number constituted 76 percent of the net gain in physicians over the decade; however, since the Chicago area had 76 percent of the physicians in 1969, the net gain really represented a stabilization in growth relative to the rest of the state.

In contrast, the increased supply of physicians had a minor impact on almost half the counties in the state. The 49 counties with populations of fewer than 25,000 inhabitants altogether had only 14 more physicians in 1979 than in 1969. The 28

TABLE 3

Percentage Distribution of Patient Care Physicians Among Illinois Counties by Demographic County Classification in 1969 and Percentage Distribution of the Increased Supply of 4,479 Patient Care Physicians from 1969 to 1979 Among Illinois Counties by Demographic County Classification

Demographic County Classification	Percentage Distribution	
	1969 Total Supply	1969–1979 Increase
Nonmetropolitan counties with fewer than 25,000 inhabitants (49 counties)	3	0.3
Nonmetropolitan counties with 25,000 or more inhabitants (28 counties)	6	4
Potential SMSAs (two counties)	1	2
Counties in SMSAs with 50,000–499,999 inhabitants (13 counties)	11	16
Counties in SMSAs with 1,000,000–4,999,999 inhabitants (four counties)	3	2
Counties in SMSAs with 5,000,000 or more inhabitants (six counties)	76	76

Source: American Medical Association.

nonmetropolitan counties with populations of 25,000 or more had a 20 percent increase in physician supply. This change meant an average increase of six physicians per county.

The major change in physician supply and distribution was found in the small metropolitan areas. Significant growth was found in the two counties considered potential SMSAs, Adams (Quincy) and Vermilion (Danville), and in the eight SMSAs with 50,000-499,999 inhabitants, Rockford, Peoria, Kankakee, Rock Island, Bloomington, Springfield, Decatur, and Champaign. In 1969, these eight SMSAs had 11 percent of the physicians, but by 1979, they had benefited from 16 percent of the increased supply. How the increase is related to changes in medical education within the state is the research question.

Effect of Programs

The eight SMSAs provide an opportunity to identify the effect of new programs in medical education by comparing the changes in physician supply in the SMSAs with medical education programs to those without programs. Table 4 describes the supply of patient care physicians and the physician-population ratio in each SMSA in 1969 and 1979. The figures indicate that the increase of supply share accruing to these SMSAs was not evenly distributed but rather was found in those with new medical school programs.

TABLE 4

Total Number of Patient Care Physicians and Number per 100,000 Population in Illinois Counties in SMSAs with 50,000–499,999 Inhabitants, 1969 and 1979

Center	Physicians in Patient Care		Physicians per 100,000 Population	
	1969	1979	1969	1979
With Medical School				
Peoria	325	514	95	140
Rockford	260	371	98	137
Springfield	192	388	113	207
Champaign	176	260	115	151
Without Medical School				
Rock Island	168	219	78	99
Decatur	124	163	96	126
Kankakee	103	105	100	108
Bloomington	78	122	84	98

Source: American Medical Association.

That the outlays for medical education

in certain areas were responsible for the patterns of increased supply can be tested using a regression method. The model included four independent variables assumed to have a relation to the ability of a city to attract physicians. The four variables were population size, per capita income, number of hospital beds, and number of physicians in nonpatient care activities. Population size would be expected to have an important relation to the number of physicians, given extensive documentation of the concentration of physicians in populous centers (9). The per capita income of an area might be considered because of the relation between physician income and distribution (10, 11) and between the economic base in a community and physician income. The assumption that large hospitals attract and support increased physician supplies would suggest the importance of considering the relation between hospital bed capacity and available physicians. Finally, the presence of physicians in professional activities other than patient care could be related to the number of patient care physicians in the sense that the availability of researchers, teachers, or administrators might enhance the attractiveness of the medical community to the practitioner. The number of nonpatient care physicians was the variable used to indicate the impact of the financial outlays for medical education. The dependent variable was patient care physicians, and data describing changes in the number of patient care physicians are contained in Table 4. In the model, population was noted as variable 2, standardized per capita income as variable 3, hospital bed capacity as variable 4, and nonpatient care physicians as variable 5; and the dependent variable of patient care physicians was variable 1. Table 5 provides the 1969 and 1979 data for each of the independent variables.

In 1969 the four independent variables were strongly related to the existing distribution pattern of physician manpower ($R^2_{1.2345}$=.98, $p < .01$); the size of the population, variable 2, however, had the strongest relationship ($r^2_{12.345}$=.86, $p <$ .05). A comparison of the data in tables 4 and 5 documents for 1969, except for Rock Island, a basic pattern associating the number of physicians with the size of population. If nothing had changed, the same pattern would have been expected in 1979. In fact, the four variables still produced a strong relationship ($R^2_{1.2345}$=.99, $p < .01$).

TABLE 5

Population, Per Capita Income, Hospital Beds, Number of Physicians in Nonpatient Care Activities in Illinois Counties in SMSAs with 50,000–499,999 Inhabitants, 1969 and 1979

Center	Population		Per Capita Income (Standardized)		Hospital Beds		Nonpatient Care Physicians	
	1969	1979	1969	1979	1969	1979	1969	1979
With Medical School								
Peoria	341,500	368,400	$3,306	$3,743	1,812	1,923	25	64
Rockford	265,100	270,400	3,492	3,767	1,039	1,217	10	49
Springfield	169,500	187,100	3,372	3,642	1,209	1,523	17	75
Champaign	153,100	172,000	3,350	3,412	668	826	12	26
Without Medical School								
Rock Island	216,100	222,100	3,290	3,896	1,142	1,311	7	16
Decatur	128,600	129,300	3,429	3,796	806	839	3	8
Kankakee	103,200	97,600	3,025	3,142	473	615	5	13
Bloomington	92,600	124,900	3,321	3,553	521	653	3	8

Source: American Medical Association.

However, when the effect of the different variables was controlled, the relationship between the size of the population and the number of patient care physicians was no longer statistically significant. In 1979 the variable most strongly correlated with the increase in patient care physicians was the increase in physicians in professional activities other than patient care ($r^2_{15.234}$=.90, $p < .05$).

The increase in nonpatient care physicians came from the faculty and administration positions opened at the new medical programs. That the change was not due to increased employment of administrators in state or regional public or mental health agencies or with business or industry was concluded after an analysis of physician and telephone directories. In fact, although the figures on the total amount of state and federal funds entering each community with a new medical education program were not available for this analysis, it is probable that the amount of the funds is correlated closely with the increase in nonpatient care physicians. As Table 5 indicates, from 1969 to 1979, Springfield received the largest increase in nonpatient care physicians. The increases in all the new medical education centers (Springfield, Rockford, Peoria, and Champaign), however, were greater than the increases in the four sites without programs (Rock Island, Decatur, Kankakee, and Bloomington).

The presence of the new medical education programs brought new patient care physicians to downstate Illinois. As Table 4 shows, the four centers with medical school programs as a group had more patient care physicians and a larger increase in physician-population ratios than the four centers without programs. That the percentage increase in Springfield was larger than the increase in the more populous centers of Peoria and Rockford reflects, as has been shown, the correlation between nonpatient care and patient care physicians, both affected by the support for the new medical education programs.

Discussion

Federal and state financing of medical education in Illinois was responsible for a major shift in patterns of physician distribution. The sites of the new regionalized medical education programs not only experienced increases in physicians involved primarily in medical school administration, teaching, and research but also drew an increased concentration of physicians in patient care.

The Rand studies (4, 5), which used a different methodology, document the number of cities with populations of varying sizes showing increases in physicians during the decade. Those analyses support a conclusion that an increased supply has led to a generalized diffusion of physicians. Evidence of a diffusion can be used to argue that physician maldistribution and shortage problems are being reduced and will eventually be met. The present research emphasizes that in Illinois physicians continue to be concentrated around tertiary care centers and that the nonmetropolitan areas have yet to be recipients of any significant diffusion, as seen in the 49 counties with populations of less than 25,000 inhabitants, which among them had only 14 more physicians in 1979 than in 1969.

The decentralization of tertiary care in Illinois has both public and professional implications. For the public, services previously available only in Chicago or out of state could be received in centers distributed throughout the state. For physicians, the increased concentration of specialists in regional centers brought referral and consultation resources closer to the nonmetropolitan area.

The research reported here documents the important effect of the placement of funds for medical education and suggests that support for undergraduate and graduate training, particularly in primary care, specifically targeted for the nonmetropolitan areas would influence more physicians to practice in those areas.

References

1. *Higher Education and the Nation's Health: Policies for Medical and Dental Education.* Special Report and Recommendations by the Carnegie Commission on Higher Education. New York: McGraw-Hill, 1970.
2. *A Report to the President and Congress on the Status of Health Professions Personnel in the United States* (DHEW Publication No. [HRA] 78-93). Washington, D.C.: U.S. Government Printing Office, 1978.
3. *Report of the Graduate Medical Education National Advisory Committee* (DHHS Publication No. [HRA] 81-653). Washington, D.C.: U.S. Government Printing Office, 1980.
4. SCHWARTZ, W. B., NEWHOUSE, J. P., BENNETT, B. W., and WILLIAMS, A. P. The Changing Geographic Distribution of Board-Certified Physicians. *N. Engl. J. Med.*, **303**:1032–1038, 1980.
5. NEWHOUSE, J. P., WILLIAMS, A. P., BENNETT, B. W., and SCHWARTZ, W. B. Where Have All the Doctors Gone? *J.A.M.A.*, **247**:2392–2396, 1982.
6. *Education in the Health Fields in Illinois.* Springfield, Illinois: Illinois Board of Higher Education, 1965.
7. *Health Professions Schools/ Selected BHM Support Data/FY 1965–1977* (DHEW Publication No. [HRA] 80-15). Washington, D. C.: U.S. Government Printing Office, 1980.
8. *Distribution of Physicians, Hospitals, and Hospital Beds in the U.S., 1969.* Chicago, Illinois: American Medical Association, 1969.
9. *Physician Distribution and Medical Licensure in the U.S., 1979.* Chicago, Illinois: American Medical Association, 1979.
10. FRUEN, M. A., HADLEY, J., and KORPER, S. P. Effects of Financial Incentives on Physicians' Specialty and Location Decisions. *Health Policy Educ.*, **1**:143–159, 1980.
11. STEELE, H. B., and RIMLINGER, G. V. Income Opportunities and Physician Location Trends in the United States. *West. Econ.*, **3**:182–194, 1965.

A Follow-Up Survey of Drug Abuse And Alcoholism Teaching in Medical Schools

Alex D. Pokorny, M.D., and Joel Solomon, M.D.

Abstract—The authors sent a questionnaire regarding the teaching of drug abuse and alcoholism to a stratified random sample of 40 U.S. medical schools, and 35 provided usable replies. The findings are summarized and are contrasted with replies received five years earlier from the same schools. During these five years, there were notable improvements in the teaching of these topics, as reflected by increases in required teaching hours, percentage of total required hours, number of elective courses offered, and number of affiliated clinical programs. The effect of the presence of a career teacher in the addictions is also evaluated.

During the past two decades there has been growing concern that medical education in the United States does not place sufficient stress on alcoholism and drug abuse. This concern has been heightened as a result of the great increase in drug use and abuse on the part of adolescents, young adults, and even children. At the same time there has been further recognition of the widespread effects of alcohol and drug abuse in medical and psychiatric disorders. The unsatisfactory condition of medical education regarding alcoholism was reviewed in a 1970 conference sponsored by the National Council on Alcoholism (1) and another sponsored by the Josiah Macy, Jr. Foundation in 1972 (2). The need for adequate training in this area was stressed in a position paper published by the American Medical Association Council on Mental Health in 1972 (3).

As a response to this identified need, in 1971 the Career Teacher Training Program in the Addictions was developed. This joint effort of the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism has as its primary goal the enhancement of the quality and quantity of alcoholism and drug abuse training taking place in schools of medicine throughout the United States. It was thought that this could be accomplished by the appointment and subsidization of medical school faculty members to develop and implement curricula and teaching techniques and materials in alcoholism and drug abuse. At present, this has been accomplished at approximately 60 medical schools.

In addition, two career teacher training centers were established under which many educational programs were instituted. In 1977 the Association for Medical Educators and Researchers in Substance Abuse (AMERSA) was organized. Its nucleus was made up of current and former career teachers. Subsequently, its member-

---

Dr. Pokorny is professor of psychiatry, Baylor College of Medicine, Houston, Texas, and Dr. Solomon is clinical assistant professor, State University of New York Downstate Medical Center College of Medicine, Brooklyn.

ship was opened to others with an interest in medical education in alcoholism and drug abuse.

As part of an evaluation of the state of medical education in alcoholism and drug abuse and of the Career Teacher Training Program in the Addictions, a survey of teaching in this area was carried out in 1976. The results of the survey have been published elsewhere (4). By 1981 the program had been in existence for 10 years, and five years had elapsed since the 1976 medical school survey. It was, therefore, decided to conduct another survey in 1981. However, the authors decided to limit the survey to a random stratified sample of medical schools rather than attempt to get replies from all medical schools. Furthermore, the survey questionnaire was simplified and limited to those inquiries which had yielded the most information in the 1976 survey.

An additional objective of the new survey was to examine what effect the presence of a career teacher would have on a particular medical school, that is, whether the presence of a career teacher would have greater influence in a school with a previously rich curriculum or in a school with a previously limited curriculum in alcoholism and drug abuse.

Procedure

The authors developed a questionnaire and sent it to the dean of each U.S. medical school in the sample. This questionnaire focused on required hours of instruction, number of electives offered, and number of affiliated clinical treatment programs for alcoholism and drug abuse. These inquiries were made for (*a*) alcoholism only, (*b*) drug abuse only, and (*c*) alcoholism and drug abuse combined. These were the three areas of information which appeared to yield the most fruitful information in the 1976 survey.

It was decided to include in the new sample only the medical schools that had responded to the 1976 survey, a total of 105 schools. The authors first arranged the schools in approximate order of "richness" of their programs at the time of the 1976 survey, using as criteria the number of required hours, the number of electives offered, and the number of affiliated alcohol or drug abuse treatment programs. This ordering was not difficult at the two extremes; but since the distribution was not bimodal, the middle group was difficult to assign. The group was, therefore, split approximately into thirds, and only the high and low thirds were used for sampling, omitting the middle group. The two extreme groups were called the "rich" and "limited" programs. An example of each is included in the report of the 1976 survey (4).

The groups were then split on the basis of whether or not the school had had a career teacher. About half, 59 (48 percent) of the 124 medical schools listed, had had a career teacher. This yielded four groups: rich program with career teacher, limited program with career teacher, rich program without career teacher, and limited program without career teacher. From each group a sample of 10 medical schools was randomly chosen for survey and analysis.

Results

Thirty-five of the 40 schools sampled returned usable replies. These were fairly evenly distributed among the four groups of 10, with eight, eight, nine, and 10 replies respectively. For comparison, the replies of the same schools to the 1976 survey were used to calculate new 1976 totals. This means that the figures given in the tables as 1976 values may differ from the earlier report (4), which was based on replies from all 105 medical schools rather than the 35 schools used in this report.

REQUIRED TEACHING HOURS

Table 1 shows the required hours of instruction for the four categories of medical schools in 1976 and 1981. The two groups of medical schools with limited programs showed the greatest increase, while the two groups with a previously rich program remained generally unchanged. The four groups, however, retained their same rank order, and there continued to be a rather large separation between the four groups.

Table 2 shows how these required hours were distributed by departments. For the 35 responding schools there was a 34 percent increase, which was fairly evenly distributed among the departments. Only neurology and pharmacology showed slight decreases.

The required teaching hours in substance abuse were also computed as a percentage of the total number of required teaching hours, using reported hours from the *1981–82 AAMC Curriculum Directory* for the 35 schools. This procedure was also followed for the same 35 schools with the use of their 1976 reports and the *1976–77 AAMC Curriculum Directory*. There was a significant overall change, with the means for the total group going from 0.4 percent to 0.6 percent (Table 3). The lowest per-

TABLE 1

Mean Number of Required Teaching Hours in Alcoholism and Drug Abuse in 35 U.S. Medical Schools with and Without Career Teacher (CT)

Schools*	1981				1976 Total	Change in Total
	Alcoholism Only	Drug Abuse Only	Combined Alcohol-Drug Abuse	Total†		
CT Schools						
Rich program	15.2	10.5	10.1	35.9	33.5	+2.4
Limited program	3.5	1.8	11.2	16.5	6.6	+9.9
Non-CT Schools						
Rich program	12.0	6.4	6.9	25.2	25.5	−0.3
Limited program	10.1	3.1	1.5	14.6	5.0	+9.6
Overall average	11.0	5.4	6.7	23.1	17.3‡	+5.8

* For explanation of categories, see text.

† Due to rounding, the figures may not add up to the totals given.

‡ The 1976 totals refer to only 35 schools; therefore, the totals differ from the nationwide totals reported for the 1976 survey (4).

TABLE 2

Required Teaching Hours in Alcoholism and Drug Abuse, by Department

Department	1981				1976 Total	Change in Total
	Alcoholism Only	Drug Abuse Only	Combined Alcohol-Drug Abuse	Total		
Psychiatry	6.4	2.7	3.0	12.1	8.9	+3.2
Pharmacology	1.1	1.3	1.0	3.4	3.6	−0.2
Medicine	0.7	0.5	0.6	1.8	1.8	†
Pathology	0.5	0.1	0.5	1.1	0.7	+0.4
Family practice	1.6	0.1	0.1	1.8	0.2	+1.6
Neurology	0.1	0.0	0.0	0.1	0.6	−0.5
Biochemistry	0.1	0.1	0.1	0.3	0.3	†
Pediatrics	0.0	0.0	0.1	0.1	0.1	†
All other	0.5	0.6	1.3	2.4	1.1	+1.3
Total	11.0	5.4	6.7	23.1	17.3	+5.8

† No change.

TABLE 3

Summary of Changes in Medical School Curriculum in Substance Abuse, 1976–1981

Schools	Required Hours in Substance Abuse							
	Mean Number		As Percentage of Total Required Hours		Mean No. of Elective Courses		Mean No. of Clinical Affiliations	
	1976	1981	1976	1981	1976	1981	1976	1981
CT Schools								
Rich program	33.5	35.9	0.8	0.9	2.0	4.2	3.4	4.5
Limited program	6.6	16.5	0.2	0.4	1.0	2.6	0.9	2.4
Non-CT Schools								
Rich program	25.5	25.2	0.6	0.6	0.5	2.3	1.7	3.4
Limited program	5.0	14.6	0.1	0.4	0.3	1.9	0.4	1.7

TABLE 4

Mean Number of Elective Courses in Alcohol and Drug Abuse in Medical Schools with and Without Career Teacher (CT)

Schools	1981				1976 Total	Change in Total
	Alcoholism Only	Drug Abuse Only	Combined Alcoholism-Drug Abuse	Total		
CT Schools						
Rich program	2.2	0.9	0.9	4.2	2.0	+2.2
Limited program	1.0	0.6	1.0	2.6	1.0	+1.6
Non-CT Schools						
Rich program	1.3	0.8	0.2	2.3	0.5	+1.8*
Limited program	0.9	0.6	0.4	1.9	0.3	+1.6
Overall average	1.3	0.7	0.7	2.7	0.9	+1.8†

* Significant at .05 level, *t*-test for correlated means.

† Significant at .01 level, *t*-test for correlated means.

centage reported by any one school changed from 0.0 percent to 0.05 percent, and the highest percentage reported changed from 1.3 percent to 2.3 percent. Those schools with previously limited programs showed the greatest improvement, but the rank order of the groups largely remained the same.

ELECTIVES

The number of elective courses in alcoholism and drug abuse offered in medical schools is shown in Table 4. The reporting schools averaged 2.7 electives in alcoholism and drug abuse in 1981. Although these numbers were modest, they represented a significant increase since 1976, actually a tripling of the average number of electives offered. The gap among the four groups of schools narrowed by 1981, although the rich program career teacher schools remained noticeably "richer."

To permit a direct comparison with the 1976 survey, the number of electives offered by schools was also tabulated to show the following results. The percentage of schools offering no electives dropped from 34 to 23 percent; schools offering only one elective dropped from 26 to 25 percent; schools offering two electives dropped from 19 to 11 percent; schools offering from three to 10 electives increased from 20 to 40 percent.

AFFILIATED CLINICAL PROGRAMS

The number of alcoholism treatment programs or drug abuse treatment programs with which each school was affiliated is shown in Table 5. There was a general improvement here, with the limited pro-

TABLE 5

Mean Number of Affiliated Clinical Alcohol and/or Drug Abuse Treatment Programs in Medical Schools with and Without Career Teacher (CT)

Schools	1981				1976 Total	Change in Total
	Alcoholism Only	Drug Abuse Only	Combined Alcoholism-Drug Abuse	Total		
CT Schools						
Rich program	1.8	1.8	1.0	4.5	3.4	+1.1
Limited program	1.0	0.9	0.5	2.4	0.9	+1.5*
Non-CT Schools						
Rich program	1.6	1.2	0.6	3.4	1.7	+1.7†
Limited program	0.7	0.3	0.7	1.7	0.4	+1.3
Overall average	1.3	1.0	0.7	3.0	1.6	+1.4†

* Significant at .05 level, *t*-test for correlated means.

† Significant at .01 level, *t*-test for correlated means.

gram groups showing the greatest increase. However, they still remained behind the other two groups, and the rank order remained the same. The group as a whole increased from an average of 1.6 affiliated programs to 3.0 affiliated programs, a substantial increase.

The data were also tabulated in another way to permit a direct comparison with the 1976 status of these same medical schools: The medical schools with no clinical affiliations dropped from 20 percent in 1976 to 9 percent in 1981; the group with one or two affiliations dropped from 46 to 40 percent; the group with three or more affiliations rose from 34 to 51 percent.

CORRELATIONS

Pearson product-moment correlations were computed between the 1981 reports and the 1976 reports for the 35 medical schools, with results as follows: total number of required hours, $r = .63$; total number of electives, $r = .52$; total number of affiliated programs, $r = .48$. These three substantial positive correlations indicated that in general the full programs tended to remain full and the limited programs tended to remain limited. It may be that five years is not time enough to permit the limited programs to catch up.

Career Teacher

To determine the effects of the presence of a career teacher in the addictions within a medical school, the authors assembled various data (Table 3). The data show that the schools that had a rich program and a career teacher in 1976 continued to get "richer," and they remained at the highest levels of all the groups.

The medical schools with a limited program in 1976 that had career teachers made very substantial gains in all categories.

The medical schools that had a rich program in 1976 without a career teacher remained relatively static in number and percentage of required hours but had gains in the other two categories. Finally, the medical schools with limited programs without a career teacher showed substantial improvement in all categories. However, this group remains well behind the other three categories.

Discussion

During the five-year period of 1976–1981, there was a notable improvement in several areas related to alcohol and drug abuse teaching in medical schools throughout the United States. This conclusion is derived from the 1981 reports of a stratified sample of schools compared with the teaching in those schools in 1976. In spite of this improvement, it should be recognized that the percentage of required teaching hours devoted to alcoholism and drug abuse remains well below 1 percent. This is far out of proportion to the prevalence and importance of alcoholism and drug abuse in public health and in hospital and office practice.

A question of particular interest was whether it was possible to identify changes brought about in the system by the Career Teacher Training Program in the Addictions, since a previous evaluation of this program had demonstrated a significant impact (5). The new study showed that the schools that had a rich program and career teachers continued to do well and get better. Similarly, the schools with limited programs with career teachers showed a marked improvement. On the other hand, those schools with a limited program without career teachers also improved, although they remained at a slightly lower level.

This appears to demonstrate a positive effect from the presence of a career teacher. However, this conclusion is complicated by the presence of other trends, such as a general increase in treatment programs in alcoholism and drug abuse during the past 10 years. There may also be a "regression to the mean" effect at work, and thus the programs picked for resurvey because they were at one extreme in 1976 would tend to approach average when resurveyed later.

Another possible complicating factor is that the Career Teacher Training Program in the Addictions may have had an influence beyond those schools in which a career teacher was located. There has been a long series of conferences, including national conferences of the career teachers and the AMERSA group, which have been open to all medical educators. Furthermore, many of the efforts of the career teacher group have been directed at all schools. During this same period there were numerous continuing medical education courses in substance abuse, and many articles on substance abuse education appeared in general medical and specialty journals. There also was a large scale effort by the federal government and private organizations to sensitize and educate the medical community regarding substance abuse (6). Therefore, the "non-career teacher" schools here are not truly a control group.

The findings again lead to the conclusion that, even though there appears to have been improvement on all fronts, there is still a long way to go before this subject area receives its appropriate share of emphasis.

References

1. Seixas, F. A., and Sutton, J. Y. (Eds.). Professional Training on Alcoholism. *Ann. N.Y. Acad. Sci.*, **178**:1–139, 1971.
2. *Medical Education in Drug Abuse: Report of a Macy Conference.* Philadelphia, Pennsylvania: William F. Fell, 1973.
3. AMA Council on Mental Health. Medical School Education on Abuse of Alcohol and Other Psychoactive Drugs. *J.A.M.A.*, **219**:1746–1749, 1972.
4. Pokorny, A., Putnam, P., and Fryer, J. Drug Abuse and Alcoholism Teaching in U.S. Medical and Osteopathic Schools. *J. Med Educ.*, **53**:816–824, 1978.
5. *Career Teacher Program Evaluation.* Pittsburgh, Pennsylvania: Consad Research Corporation, 1977.
6. National Clearinghouse for Alcohol Information. Alcoholism Education for Physicians and Medical Students: An Overview. *Alcohol Health Res. World*, **3**:2–9, Spring 1979.

students (3). Thus students were encouraged to relate the material they were exposed to in the program to their own personal feelings. The small group process allowed instructors to create a nonjudgmental ambience within which students could reveal crucial but sensitive reactions to the issues being addressed. The program provided an opportunity for the exploration of crucial issues related to medical care but often neglected in the undergraduate medical education system.

Conclusion

The educational experiment described here has introduced an innovative approach to the complex task of blending clinical experience and behavioral science theory for undergraduate medical students.

Two innovations will be added to the course in 1983. One is an extensive evaluation of the program consisting of a number of tests of attitude change. The control group will be selected at random from the remaining second-year students. The other addition will involve a systematic gathering of information about the students involved (for example, age, class performance, and educational background) so that further analysis and conclusions can be made.

References

1. WISE, T. N. Training Oncology Fellows in Psychological Aspects of Their Specialty. *Cancer*, **39**:2584–2587, 1977.
2. LOVE, R. R., HAYWARD, J., and STONE, H. L. Attitudes About Cancer Medicine Among Primary Care Residents and Their Teachers. *J. Med. Educ.*, **55**:211–212, 1980.
3. BARTON, D. The Need for Including Instruction on Death and Dying in the Medical Curriculum. *J. Med. Educ.*, **47**:169–175, 1972.

Perceptions of Recent Graduates of the Adequacy Of Anesthesia Training Programs

Fred J. Spielman, M.D., and Edwin A. Bowe, M.D.

In recent years considerable concern has been expressed about resident education in anesthesia training programs. Studies have been conducted delineating the percentage of time spent in specific areas of anesthesia training, the ratio of attending physicians to residents, and the types and sizes of hospitals used for education (1). However, little is known about anesthesia residencies from the point of view of recent trainees. In the study reported here, the authors examined the assessment of recent graduates of training programs on how well their residencies prepared them for their practices.

Methods

Using the American Society of Anesthesiologists' *Directory of Members*, the authors identified 576 individuals whose status changed from "resident member" to "active member" between 1979 and 1980. A questionnaire was mailed to a random sample of 319 anesthesiologists drawn from this group.

The questionnaire was designed to measure how well the anesthesiologists felt their training had prepared them to meet the level of skills and knowledge required in their present jobs; they were asked whether they were inadequately trained, trained just about right, or more than adequately trained. They were asked to evaluate the adequacy of their training programs overall and the adequacy of training received in 18 specific areas relevant to the practice of anesthesia.

Results

A total of 224 (70.2 percent) responses were received from two mailings. Overall, 67.6 per-

---

Dr. Spielman and Dr. Bowe are assistant professors, Department of Anesthesiology, University of North Carolina School of Medicine, Chapel Hill.

TABLE 1

Percentage of 224 Recent Graduates of Anesthesia Training Programs Who Felt Their Training Was Inadequate or Excessive

Responsibilities	Training Inadequate	Training Excessive
Operating Room		
Vascular anesthesia	1.7	52.5
Spinal and epidural block	2.9	51.2
Thoracic anesthesia	4.0	40.7
Neurosurgical anesthesia	6.2	48.1
Pediatric anesthesia	7.5	42.6
Cardiac anesthesia	8.1	42.0
Obstetric anesthesia	11.6	45.7
Upper extremity block	18.5	30.9
Other regional blocks	27.7	19.1
Nonoperating Room		
Cardiopulmonary resuscitation	12.1	37.7
Intensive care	19.7	42.6
Pain control	58.1	13.0
Nonpatient Care		
Working with certified registered nurse anesthetists	25.4	22.2
Lectures, reports, teaching	28.9	22.8
Operating room scheduling	45.1	11.1
Equipment maintenance	71.1	5.6
Equipment purchasing	86.7	1.9
Business aspects	89.0	1.9

cent of the respondents felt that the skills they acquired during their residency programs were appropriate for their current needs; 21.0 percent felt their training was inadequate to meet their needs; and 11.4 percent felt they were more than adequately trained. A high number of anesthesiologists felt that they were adequately trained in operating room responsibilities, but training in nonoperating room responsibilities was perceived by the respondents to be less satisfactory (Table 1). The respondents uniformly felt their training in the nonpatient care aspects of anesthesia was less adequate than the medical aspects of their training.

Discussion

The high frequency of anesthesiologists who felt they were adequately trained in operating room responsibilities is not surprising considering the amount of time spent on surgical anesthesia in training programs. In a study by Steinhaus and colleagues (1), it was found that an average of 17 months of a 24-month residency were spent in surgical anesthesia. The perception that training for nonoperating room responsibilities was inadequate may be due to the small amount of time spent in these relatively newer areas, the lack of interest by the residents in the areas, the burgeoning of knowledge in these fields, a belief by the department chairmen that these areas are better dealt with during the fellowship, or to the fact that residents and department chairmen do not realize that more time and energy are expended in these areas in most practice situations. It might be argued that the nonpatient care aspects of anesthesia are so diverse that adequate education in these areas is impossible and, furthermore, that these areas are beyond the scope of training programs.

Whatever the specific reasons for these deficiencies in nonoperating room and nonpatient care training, the following points should be considered in planning changes to overcome these deficiencies:

1. Coordination among several teaching hospitals to provide training in pediatric and obstetric anesthesia, critical care medicine, and pain control would work to eliminate inadequate training in these areas caused by limited patient populations in some hospitals.

2. Pilot studies have shown that short training programs can produce significant, observable improvement in physician teaching (2). Participation of physicians in a teaching skills program should be voluntary, but it should be strongly encouraged.

3. An awareness of the areas in which recent anesthesia graduates feel they are deficient may be a sufficient incentive for current residents to modify their remaining training via electives, independent reading, and fellowships.

The data from the survey reported here may add to the existing knowledge concerning the desirable content of anesthesia residency training programs and the assignment of education priorities. It should be emphasized that perceived educational deficiencies and the quality of actual performance are not necessarily correlated.

References

1. Steinhaus, J. E., Epstein, R. M., Hamilton, W. K., Larson, C. P., and Lawrence, R. M. A Survey of Academic Anesthesiology. *Anesthesiology*, 47:53–61, July 1977.
2. Lawson, B. K., and Harvill, L. M. The Evaluation of a Training Program for Improving Residents' Teaching Skills. *J. Med. Educ.*, 55:1000–1005, 1980.

Vol. 58 No. 5 May 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Stress in Medical Education

The Question of Stress Among First-Year Medical Students
Robert E. Mitchell, Janet R. Matthews, Thomas G. Grandy, and James V. Lupo

A Committee on Well-Being of Medical Students and House Staff
Harvey M. Weinstein

Resident Performance and Sleep Deprivation: A Review
Michael J. Asken and David C. Raham

Stress in the Medical Career (Editorial)
Emily Mumford

Physicians Who Move and Why: From Residency to Practice, 1974–1978
Lorna E. Wunderman and Steven R. Steiber

Clinical Instruction in Medicine: A National Survey
C. Benjamin Meleca, Frank T. Schimpfhauser, Joseph K. Witteman, and Larry A. Sachs

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 5 • May 1983

Stress in Medical Education

The Question of Stress Among First-Year Medical Students—Robert E. Mitchell, Janet R. Matthews, Thomas G. Grandy, and James V. Lupo 367

A Committee on Well-Being of Medical Students and House Staff—Harvey M. Weinstein 373

Resident Performance and Sleep Deprivation: A Review—Michael J. Asken and David C. Raham 382

Physicians Who Move and Why: From Residency to Practice, 1974-1978—Lorna E. Wunderman and Steven R. Steiber 389

Clinical Instruction in Medicine: A National Survey—C. Benjamin Meleca, Frank T. Schimpfhauser, Joseph K. Witteman, and Larry A. Sachs 395

Health-Related Experiential Learning for College Undergraduates—Thomas P. Almy, Roger D. Cohen, T. Hale Ham, Evalyn O. Hornig, and Juanita Price 404

Medical Students' Skills, Attitudes, and Behavior Needed for Literature Reading—Richard K. Riegelman, Gail J. Povar, and John E. Ott 411

A National Survey of Performance Objectives of Physician's Assistant Training Programs—Archie S. Golden and James F. Cawley 418

Communications: A Senior Medical Student Seminar Designed To Promote Problem-Solving—James F. Donohue and James M. Shumway 425

Medical History as an Introduction to Clinical Reasoning—Russell C. Maulitz, Roy M. Poses, and Mark J. Young 427

Alcoholism Education in the Medical Curriculum—Jack H. Mendelson and Nancy K. Mello 430

An Evaluation of Trainee Performance in the Case Presentation—Martin Klos, James B. Reuler, David A. Nardone, and Donald E. Girard 432

Videotape Teaching in Family Practice Residencies—Max G. Jackson and Ronald E. Pinkerton 434

Editorial: Stress in the Medical Career 436

Datagram: Results of the NRMP for 1983 438

Bibliography 441

Letters to the Editor 445

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

Physicians Who Move and Why: From Residency to Practice, 1974–1978

Lorna E. Wunderman and Steven R. Steiber, Ph.D.

Abstract—As medical residents leave their residencies, a majority also move away from the locales in which they received their training. Data presented in this paper on physicians entering their first professional positions between 1974 and 1978 show that over 65 percent left the counties of their residencies. Following the national migration pattern of the civilian population, the medical residents left the northern "Frost Belt" and entered the southern "Sun Belt" of the United States. Physician "movers" typically were in nonprimary care medical specialties and moved into self-employment or office-based medical practices. These migrating physicians, compared with physician "stayers," were disproportionately male, more often resided in states other than those of their medical education, and moved into smaller urban or nonurban centers of the United States. Other characteristics that distinguish movers from stayers also are presented here.

Within the past two decades changes in the medical education system have produced an unprecedented number of new physicians and have exerted a marked influence on health care delivery in the United States (1–3). While the general population is now experiencing historically low growth rates, the physician population is expected to undergo rapid growth during this decade. According to a 1979 report of the U.S. Department of Health, Education, and Welfare, the total population is expected to increase by 8 to 10 percent by 1990, whereas the number of active physicians will increase by twice that rate to approximately 536,000. As a result, it is estimated that the physician per 100,000 population ratio will grow from the 1980 ratio of 202 to 243 by 1990, an increase of 20 percent (1).

This projected increase in the supply of physicians continues to give rise to questions relating to the distribution of physicians and has provided the impetus for governmental programs to reallocate physician manpower resources. Although federal emphasis in this regard has been considerably curtailed under the Reagan administration, private sector and community-based initiatives are likely to arise out of the continuing need to provide adequate medical services on a local level. While under the current political climate attempts to influence the distribution of physicians will probably involve the operation of market forces, data on the locational behavior of "new physicians" (physicians completing their residency programs and

---

Ms. Wunderman is director, Department of Membership Information Services, American Medical Association, Chicago, Illinois. Dr. Steiber is director of research and development, Allied Research Associates, Chicago, Illinois. The views expressed here are those of the authors and do not necessarily represent the position of the American Medical Association.

going into practice) continue to provide the basis for policy-making in this area.

As central in the production of medical services, the role of the physician impacts significantly on a wide range of health care delivery issues. The supply of physicians in any one area at a given time may, therefore, affect the availability, quality, and cost of medical care provided. The career and mobility behavior of physicians after residency training, however, is of a far more dynamic nature than has generally been acknowledged. Of the approximately 48,357 physicians who completed their medical residencies between 1974 and 1978, a total of 31,549 (65.2 percent) moved to new counties to establish practices in the succeeding four years. In light of the scope of this migration, the present study of physician location and practice patterns was undertaken.

In this paper the authors present data on the medical resident population entering professional practice for the first time between 1974 and 1978 and discuss migration streams, the characteristics of typical "movers" and "stayers," and the practices and locations entered into by each.

Method

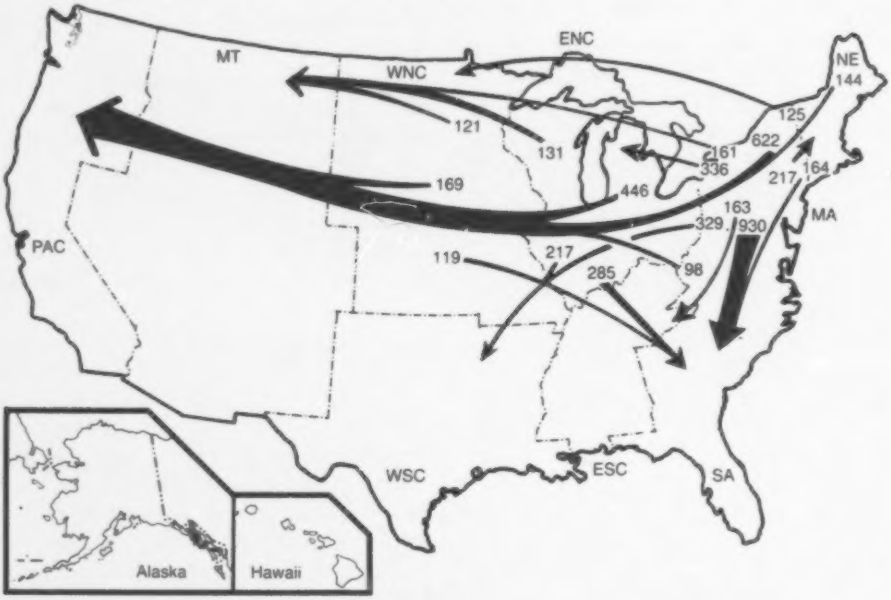
Since 1906 the American Medical Association has compiled in its Physician Masterfile professional and practice-related information on all physicians in the United States. Originally developed for membership and mailing purposes, the masterfile is now also used for research on physician manpower and health-related issues (2, 4).

Data were used in the present analysis to track new physicians who were in medical residencies in 1974 but who completed residency training by 1978. Since the Physician Masterfile was updated in 1973 and 1977, the authors thought that these endpoints (1974–1978) offer the most current and useful practice data available on resident physicians. In addition to the physician data, the principal focus of this paper, selected county-level characteristics also are examined to offer community information relevant to a study of the physician's early medical career.

Results and Discussion

The metropolitan centers of the South and Southwest are among the fastest growing in the United States in terms of population. This population increase is due principally to an influx of migrants from the North (5). Figure 1 depicts by means of arrows and associated numbers major net migration streams of resident physicians across census divisions. As in civilian migration streams, the largest outflows of new physicians were from the "Frost Belt" (the Middle Atlantic and East North Central census divisions). The largest influxes were to the "Sun Belt" (the South Atlantic and Pacific census divisions).

The typical physician who, upon completing a medical residency, moved to a new county to establish a practice was different from the physician who remained. Factors which help distinguish typical movers from typical stayers included the early professional career selections of each as well as characteristics of areas in which careers are launched. For example, the medical specialty selections of movers versus stayers are evident in the distributions shown in Table 1. The majority of new physicians were in the surgical and internal medicine specialties. This would be expected since the largest residency training programs are in surgery and internal medicine. Newly established physicians in the surgical specialties tended to move away from the areas where they were in residency training, whereas psychiatrists were more stationary. Among other factors, choice of specialty in residency training determines the physician's inclination to move or stay. In this case, psychiatrists, as opposed to surgeons, who



Migration streams are based on the total resident physician population in 1974 who completed residency training by 1978. Also, only net migration streams of approximately 100 or more physicians are presented in this figure. NE indicates Northeast; MA, Middle Atlantic; SA, South Atlantic; ESC, East South Central; WSC, West South Central; PAC, Pacific; MT, Mountain; WNC, West North Central; and ENC, East North Central.

FIGURE 1
Major net migration streams of physicians going from residencies to practices, 1974–1978.

directly served a particular clientele during their medical residencies might prefer to remain in the location of their residencies in order to retain that clientele.

The second panel of Table 1 shows that mobile physicians had very nearly the same residency settings in 1974 as did stayers. A slightly greater percentage of stayers, however, were in nongovernmental, hospital-based graduate medical education programs. Pluralities of both physician movers and stayers in 1978 went into self-employment, and this category's high representation perhaps indicates a variety of opportunities available for medical practice. Physicians dependent upon institutional settings for professional careers have more limited opportunities and fewer locales from which to choose than those physicians who enter, for instance, group, solo, partnership, or similar arrangements. Once established in a practice, however, this pattern reverses itself, according to previous studies (4).

A majority of physicians in the United States, particularly those in primary care medical specialties, maintain office-based practices (2). In the present study, physicians leaving their residency training programs adopted a similar distribution across professional activities (Table 1). As most physicians leaving residency training must seek office-based practice opportunities beyond their immediate locales, they were disproportionately represented in this category among the movers.

Previous studies have shown that prior exposure to a state through medical school

BEST AVAILABLE COPY

TABLE 1

Professional Characteristics of 'Movers' and 'Stayers' Leaving Medical Residencies, 1974 Through 1978

Characteristics	Percent of Physicians	
	Movers (*n* = 31,549)	Stayers (*n* = 16,808)
1978 Specialty		
Primary Patient Care	48.6	49.5
Internal medicine	26.8	29.2
Pediatrics	8.0	7.9
Obstetrics/gynecology	6.5	6.8
General/family practice	7.3	5.6
Nonprimary care	51.3	50.6
Surgery	22.7	17.6
Psychiatry	6.4	10.4
Anesthesiology	4.1	4.1
Radiology	5.9	5.9
Other	12.2	12.6
1974 Residency		
Self-employed	0.0	0.0
Medical school	8.4	7.3
Nongovernment hospital	71.9	75.5
Local government hospital	6.0	6.0
State government hospital	2.8	2.6
Federal government*	8.8	6.7
Other organization	0.0	0.0
No classification	2.1	1.9
1978 Practice		
Self-employed	32.1	24.9
Medical school	4.5	7.0
Nongovernment hospital	6.4	8.7
Local government hospital	2.4	3.0
State government hospital	2.0	2.7
Federal government hospital	10.1	4.7
Federal government*	0.6	0.2
Other organization	0.7	0.7
No classification	41.2	48.1
1978 Professional Activity		
Office based	55.8	49.3
Hospital staff	17.2	14.5
Administration	0.8	1.1
Medical teaching	1.9	3.0
Medical research	6.6	7.5
Other activity	0.6	0.6
Inactive	0.5	0.5
No classification	16.6	23.6
1978 Practice Location		
Same state as medical school	22.1	32.7
Other state	77.9	67.3

Source: American Medical Association Physician Masterfile, 1974–1978, and AMA Division of Survey and Data Resources.

* Other than hospital.

or residency training influences a physician's decision to return or stay (5). More than simply exposure to an area during medical training, any previous residential stay in an area appears to predispose a physician to locate in an area or to stay once there (6). In the present study, those physicians who remained in a county after residency were more likely to have completed their medical education there as well (Table 1).

Previous studies have shown that migrants are generally younger than nonmigrants (7, 8). Although Table 2 shows a slightly higher percentage of younger physicians (less than 30 years of age) moving, among physicians just leaving residencies for their first professional positions, there was no apparent difference between the median ages of movers and stayers. Therefore, it likely is not age per se that predicts physician mobility but rather career stage. In a population of physicians at the same career stage (such as in the present study), there apparently is no appreciable difference in the ages of movers and stayers.

Previous studies have shown that for the established physician population and the civilian population, women are more likely than men to move (4, 8). Among resident physicians, however, this trend is reversed as seen in the present study. Although the presence of a spouse can affect women's career mobility, insufficient data on residents' marital status do not allow an explanation based on this factor.

To the extent that they can make environments more or less attractive, community-level characteristics often act as pushing or pulling mechanisms for physicians' location decisions. There is an expressed desire among the civilian population, for instance, to move into relatively smaller or rural communities rather than larger metropolitan areas (9). The 1974 and 1978 distributions of resident physician movers and stayers across county population strata suggest that physicians have the same preferences. As shown in Table 2, new physicians, like established physicians, who move are selecting smaller urban and nonurban centers over more populated locations (4, 8). For example, between residency training in 1974 and established practice in 1978, the percentages of physicians located in nonmetropolitan areas (counties with less than 50,000 inhabitants) increased from 2.0 percent to 17.1 percent. In contrast to these movers, the proportion of physicians in metropolitan areas (populations greater than 50,000) during their residency training decreased from 97.9 percent to 82.8 percent when they moved into an established practice. Resident movement to rural areas might also be due to a lower ratio between residency programs and practice opportunities in the urban areas compared with the rural areas.

Incomes of area inhabitants have been described by some as an attractive force when physicians relocate (10, 11). However, data presented elsewhere suggest that established physicians are not motivated by population income (4), nor are physicians at other career stages generally motivated by this measure of area wealth. In 1974, resident movers were located in areas with median household incomes of $13,452, as opposed to $13,509 for the physicians who chose to remain in the same location over the study period. By 1978, movers just completing residencies relocated in areas with median incomes of $19,265, as opposed to $19,813 for those who stayed. These findings indicate that, on average, physician movers just completing residencies did not relocate in areas with high average county household incomes. Table 2 shows a more detailed distribution of these physicians by average county household income.

TABLE 2

Other Selected Characteristics of Physician 'Movers' and 'Stayers' Leaving Medical Residencies, 1974–1978

Characteristics	Percent of Physicians	
	Movers	Stayers
Age in 1974		
Less than 30	56.2	55.3
30–44	42.5	42.6
45+	1.2	2.2
Sex		
Female	9.9	15.7
Male	90.1	84.3
Residency Location		
Nonmetropolitan	2.0	1.2
Less than 10,000	0.0	0.0
10,000–24,999	0.3	0.1
25,000–49,999	0.8	0.5
50,000+	0.9	0.6
Metropolitan	97.9	98.7
Potential SMSA*	1.3	0.6
50,000–499,999	15.4	11.3
500,000–999,999	15.7	14.6
1,000,000–4,999,999	45.1	45.5
5,000,000+	20.4	26.7
Practice Location		
Nonmetropolitan	17.1	1.2
Less than 10,000	0.6	0.0
10,000–24,999	2.7	0.1
25,000–49,000	5.6	0.2
50,000+	8.2	0.9
Metropolitan	82.8	98.8
Potential SMSA*	1.9	0.6
50,000–499,999	20.9	10.2
500,000–999,999	12.6	14.0
1,000,000–4,999,999	37.0	47.3
5,000,000+	10.4	26.7
1974 Residency Location Income†		
$1–9,999	0.4	0.3
10,000–14,999	85.2	87.7
15,000–19,999	12.6	10.0
20,000–24,999	1.8	1.9
25,000+	0.0	0.0
1978 Practice Location Income‡		
$1–9,999	0.1	0.0
10,000–14,999	8.2	4.0
15,000–19,999	52.1	48.5
20,000–24,999	29.3	42.5
25,000+	10.4	5.0

Source: AMA Physician Masterfile, 1974–1978, and AMA Division of Survey and Data Resources.

* SMSA = Standard Metropolitan Statistical Area as established by the U.S. Bureau of the Census.

† Average county household income in 1974.

‡ Average county household income in 1978.

Conclusion

In recent decades numerous programs have encouraged physicians to locate or specialize where need for their services has been identified. Equally important in affecting distribution of physicians in the United States have been characteristics of the physicians themselves and areas in which practice opportunities exist. Although graduating residents depart from some of the patterns of the larger population, they follow many of the same incentives which guide others in location decisions.

Patterns of physician distribution and migration offer important considerations for health insurers, medical organizations, and health care administrators. State residency program administrators must realize that individual graduate medical education programs only partially influence the location decisions of graduating residents, and this complicates state plans for local needs. Although there is some tendency to do so, resident physicians will not necessarily remain in the areas in which they are trained. Therefore, while state efforts to retain physicians have a bearing on how local health needs are met, awareness of national trends and patterns discussed in this paper will help in health manpower planning.

References

1. *Third Report to the President and Congress on the Status of Health Professions Personnel in the United States* (DHHS Publication No. [HRA] 82-2). Washington, D.C.: U.S. Department of Health and Human Services, 1982.
2. WUNDERMAN, L. E. *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago, Illinois: American Medical Association, 1979.
3. WOOLF, M. A., UCHILL, V. L., and JACOBY, I. Demographic Factors Associated with Physician Staffing in Rural Areas: The Experience of the National Health Service Corps. *Med. Care,* **19**:444–451, 1981.
4. STEIBER, S. R. Physicians Who Move and Why: Changes in Physicians' Practices and Locations, 1974–1978. *J.A.M.A.*, **248**:1490–1492, 1982.
5. BERRY, B. J. L., and DAHMANN, D. C. Population Redistribution in the United States in the 1970s. In *Population Redistribution and Public Policy.* B. J. L. Berry and D. C. Dahmann (Eds.). Washington, D.C.: National Academy of Sciences, 1980, Pp. 8–49.
6. WEISKOTTEN, H. G., WIGGINS, W. S., ALTENDERFER, M. E., GOOCH, M., and TIPNER, A. Trends in Medical Practice—An Analysis of the Distribution and Characteristics of Medical College Graduates, 1915–1950. *J. Med. Educ.*, **35**:1071–1121, 1960.
7. LANSING, J. B., and MUELLER, E. *The Geographic Mobility of Labor.* Ann Arbor, Michigan: Survey Data Center, 1967.
8. STEIBER, S. R. Geographic Mobility of Physicians: 1971–1975. In *Profile of Medical Practice, 1980.* G. L. Glandon and R. J. Shapiro (Eds.). Chicago, Illinois: American Medical Association, 1980, Pp. 67–78.
9. FUGUITT, G. V., and ZUICHES, J. J. Residential Preferences and Population Distribution. *Demography,* **12**:491–504, 1975.
10. LANGWELL, K. M., and BUDDE, N. W. Urban-Rural Differences in General and Family Practices: An Examination of Location Choice Incentives. In *Socioeconomic Issues of Health, 1978.* J. L. Werner and J. R. Leopold (Eds.). Chicago, Illinois: American Medical Association, 1978, Pp. 101–119.
11. YETT, D. E., and SLOAN, F. A. Migration Patterns of Recent Medical School Graduates. *Inquiry,* **11**:125–142, 1974.

A National Survey of Performance Objectives Of Physician's Assistant Training Programs

Archie S. Golden, M.D., and James F. Cawley

Abstract—A nationwide survey of physician's assistant (PA) training programs was carried out to determine the performance expected of students upon graduation. A list of tasks reflecting primary medical care problems was sent to PA program directors asking whether they expected their graduates to be able to perform the task, only to know about the task, or neither to be able to perform nor to have knowledge of the task. The results indicated that all students were expected to perform a history and physical examination. Almost all of the program directors expected students to establish a working diagnosis for the most common problems and to formulate a management plan for many of them. Extensive skills in patient education and counseling were expected. There was considerable congruence among the directors in performance expectations of students. The expected performance of the PA student by graduation emerged as comprehensive and not merely technical.

Programs designed to educate physician's assistants (PAs) have been established in a variety of educational institutions and by 1982 had graduated over 13,000 primary care providers. These programs encompass the traditional and the innovative approaches to medical education and share the common objective of training mid-level practitioners for primary care.

In an effort to understand better how PA programs prepare students for practice, the Association of Physician Assistant Programs (APAP) in 1979 conducted a detailed survey of the performance objectives set forth in program curricula. The major objective of the study was to determine the similarities and differences among PA programs, particularly as they relate to task expectations for primary care practice. The authors are unaware of similar efforts in other health professions that have examined performance expectations of educational programs on a nationwide basis.

Background

Physician's assistant programs have their roots in the pioneering effort of the Duke University Physician's Assistant Program in the 1960s, the University of Colorado Child Health Associate Program, and the MEDEX program of the University of Washington. These programs provided the educational models for the development

---

The work on which this article was based was supported by the Association of Physician Assistant Programs, Arlington, Virginia, and by a grant from the Robert Wood Johnson Foundation, Princeton, New Jersey.

Dr. Golden is associate professor, Department of International Health, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland. Mr. Cawley is assistant professor, Department of Health Care Sciences, George Washington University School of Medicine and Health Sciences, Washington, D.C.

of the programs in a wide variety of institutional settings.

A typical PA program is a two-year baccalaureate degree program based in a medical school. A number of programs, however, are three or four years in length and may offer only a certificate, while several are set in liberal arts or community colleges. Nonetheless, the length of professional education in almost all programs is two years.

Educating the physician's assistant is based in many ways on medical education, the key differences being the PA program's shorter course of didactic study and the sustained emphasis on primary care. Unlike other health professional training, PA programs were established as competency-based educational programs that set forth specific performance objectives so as to define the end product for students. Kane has recommended that medical education move in this direction (1).

Commonly, PA program curricula comprise two segments. The first portion, formal didactic instruction, includes course work in the basic medical sciences, applied behavioral sciences, clinical data-gathering, and clinical medicine. In most programs, this phase lasts from six to 12 months. The second major component is comprised of clerkships and preceptorships in inpatient and outpatient clinical settings with particular emphasis on primary care. The range of this experience is anywhere from nine to 15 months.

Physicians predominate as faculty members in PA programs, though the numbers and responsibilities of graduate physician's assistants as faculty members are steadily increasing (2). Programs usually employ a small number of full-time faculty members in roles as program directors, clinical coordinators, and various types of instructors and a large number of part-time faculty members (mostly physicians) to serve as clinical preceptors, supervisors of clerkships, or instructors in didactic areas.

As a group, physician's assistants have been increasingly heterogeneous. From 1967 to 1973, program graduates consisted of 60 percent ex-military corpsmen and 9 percent registered nurses, while 1977 graduates showed 29 percent and 18 percent respectively in those categories. In 1967–1968 there were no women graduates, while the graduating classes of 1978–1979 included 44 percent women. Also, the number of students with previous baccalaureate degrees rose from 32 percent in 1967–1974 to 62 percent in 1979 (3).

In 1982, there were 54 programs for physician's assistants accredited by the Council on Allied Health Education and Accreditation (CAHEA) of the American Medical Association. Standards for programs are set forth in the "Essentials of an Approved Educational Program for the Assistant to the Primary Care Physician" (4) as well as in the review process conducted by the council's Joint Review Committee on Educational Programs for Physician Assistants. About 1,500 PAs are graduated annually by these programs. Entry-level competency for practice is determined by the examination administered by the National Commission on Certification of Physician's Assistants. In 1982, 38 states required successful completion of this examination as the legal basis for practice.

Methods

On behalf of the APAP, the authors in 1979 sent a survey questionnaire to all existing physician's assistant programs. The questionnaire consisted of a listing of health care tasks. These tasks were selected as representative of those functions developed in the role delineation study of the American Academy of Physician's Assistants (5). The major areas covered in this

TABLE 1

Number and Percentage of Physician's Assistant Programs Requiring Students To Establish Working Diagnosis*

Problem/Disease	Can Diagnose		Has Knowledge of		No Need To Know		No Answer
	No.	Percent	No.	Percent	No.	Percent	No.
Constipation	32	100	0	0	0	0	1
URI (cold)	32	100	0	0	0	0	2
Asthma	30	97	1	3	0	0	2
Gastroenteritis	31	97	1	3	0	0	1
Angina pectoris	30	97	1	3	0	0	2
Pharyngitis/tonsillitis	30	97	1	3	0	0	2
Otitis media	30	97	1	3	0	0	2
Peptic ulcer	31	97	1	3	0	0	1
Anemia	30	94	2	6	0	0	1
Appendicitis (acute)	30	91	3	9	0	0	0
Dermatophytosis	26	87	4	13	0	0	3
Emphysema	26	84	5	16	0	0	2
Hepatitis	25	78	7	22	0	0	1
Essential hypertension	18	55	15	45	0	0	0

* Percentage based on the number answering questions; total questionnaires answered were 33.

TABLE 2

Number and Percentage of Physician's Assistant Programs Requiring Students To Formulate Management Plan*

Problem/Disease	Can Formulate Plan		Has Knowledge of		No Need To Know		No Answer
	No.	Percent	No.	Percent	No.	Percent	No.
URI (cold)	30	100	0	0	0	0	3
Gastroenteritis	30	97	1	3	0	0	2
Pharyngitis/tonsillitis	29	97	1	3	0	0	3
Otitis media	29	97	1	3	0	0	3
Constipation	31	97	1	3	0	0	1
Asthma	27	93	2	7	0	0	4
Appendicitis (acute)	28	90	3	10	0	0	2
Peptic ulcer	28	90	3	10	0	0	2
Dermatophytosis	24	86	4	14	0	0	5
Emphysema	20	69	9	31	0	0	4
Anemia	20	67	10	33	0	0	3
Hepatitis	19	61	12	39	0	0	2
Essential hypertension	12	39	15	48	4	13	2

* Percentage based on the number answering questions; total questionnaires answered were 33.

task listing included: (*a*) data-gathering skills, (*b*) diagnostic skills, (*c*) ability to formulate management plans, (*d*) performance of therapeutic procedures, and (*e*) patient education skills. For each of the tasks, PA program directors were asked a three-part question: When the student graduates, do you expect him (*a*) to be able to perform the task, (*b*) to have only knowledge of the task, or (*c*) neither to be

TABLE 3

Number and Percentage of Physician's Assistant Programs Requiring Students To Promote Preventive Health Care*

Promotion Activity	Can Perform		Has Knowledge of		No Need To Know		No Answer
	No.	Percent	No.	Percent	No.	Percent	No.
Breast self-examination	32	100	0	0	0	0	1
Immunizations	33	100	0	0	0	0	0
Non-use of tobacco/alcohol/drugs	32	97	1	3	0	0	0
Exercise and diet	31	97	1	3	0	0	1
Contraception and family planning	26	81	5	16	1	3	1

* Percentage based on the number answering questions; total questionnaires answered were 33.

TABLE 4

Number and Percentage of Physician's Assistant Programs Requiring Students To Provide Counseling*

Type of Counseling	Can Perform		Has Knowledge of		No Need To Know		No Answer
	No.	Percent	No	Percent	No.	Percent	
Sexual problems: Frigidity/Impotence	27	82	5	15	1	3	0
Anxiety Reactions	25	76	8	24	0	0	0
Depression—non-psychotic	25	76	8	24	0	0	0
Alcohol/drug abuse	24	73	9	27	0	0	0
Psychosomatic illness	23	70	10	30	0	0	0
Behavior problems of children and adults	22	67	10	30	1	3	0
Terminal illness	18	55	15	45	0	0	0

* Percentage based on the number answering questions; total questionnaires answered were 33.

able to perform nor to have knowledge of the task? In other words, the program directors were asked what the expected performance of students was at graduation.

The questionnaire was mailed to all of the 54 PA programs. Thirty-nine questionnaires were completed and returned, for a response rate of 72 percent. Because of substantial structural differences among subtypes of PA programs (MEDEX, surgical assistant, nurse practitioner), only the data from two-year primary care PA programs were considered comparable. This brought the final number of considered questionnaires to 33.

In this study, no effort was made to determine what percentage of students actually attained the required performance level.

Results

Directors of all physician's assistant programs reported that graduates were expected to perform a complete history and physical examination on adult and pediatric patients. However, several directors indicated that certain specialized segments of the physical examinations were not required; that is, one program did not require unassisted performance of the pelvic examination, and the pediatric neurological examination was exempt in six programs.

Table 1 shows a representative listing of primary care problems/diseases and the percentage of PA programs requiring graduates to diagnose these problems upon graduation. For these entities, all programs required at least knowledge of their diagnostic aspects. About 97 percent of programs expected graduates to diagnose such primary care conditions as constipation, otitis media, asthma, pharyngitis/tonsillitis, peptic ulcer, and angina pectoris. Given the frequency of the disease, a surprising result was that only a little more than half (55 percent of the responding programs) required graduates to diagnose essential hypertension. For the same representative spectrum of problems/diagnoses, PA programs reported similar, though not identical, requirements in terms of abilities to formulate management plans (Table 2). Although 94 percent required students to diagnose anemia, only 67 percent expected formulation of a management plan for this disease. Only 39 percent expected a management plan for essential hypertension. These lower figures represent the fact that physician consultation was essential prior to the initiation of treatment plans in actual clinical practice.

Nearly all programs required PA students to gain specific skills in health promotion and preventive care. Table 3 shows the number of programs in which students were expected to provide patient education about breast self-exam (100 percent); use and abuse of alcohol, tobacco, and drugs (97 percent); and immunizations (100 per-

TABLE 5

Number and Percentage of Physician's Assistant Programs Requiring Students To Perform and Interpret Tests*

Test	Perform						Interpret					
	Can Perform		Has Knowledge of		No Need To Know		Can Perform		Has Knowledge of		No Need To Know	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Visual screening	29	100	0	0	0	0	30	100	0	0	0	0
Electrocardiogram	29	100	0	0	0	0	25	83	5	17	0	0
Tuberculin test	28	97	1	3	0	0	30	100	0	0	0	0
Pap smear	26	90	1	3	2	7	15	50	8	27	7	23
Urinalysis	25	86	4	14	0	0	28	93	1	3	1	3
Hematocrit	23	79	4	14	2	7	27	93	2	7	0	0
White blood cell count	20	69	7	24	2	7	24	83	4	14	1	3
Tonometry	16	55	10	34	3	10	22	76	6	21	1	3
Audiometry screening	12	40	10	33	8	27	14	48	5	17	10	34
Chest X-ray	1	4	17	61	10	36	13	45	12	41	4	14

* Percentage based on the number answering question; total questionnaires answered were 33.

cent). A majority of programs (55 to 82 percent) expected students to provide counseling to patients and families; aspects of terminal illnesses and sexual problems were the least and the most frequently required counseling tasks, respectively (Table 4).

In terms of laboratory tests, 86 percent of the programs required the performance of a urinalysis; 100 percent required the performance of an electrocardiogram; 79 percent required hematocrit determination; and 69 percent required the white blood cell count and differential (Table 5). Over 90 percent required performance of the Pap smear and tuberculin skin tests. Only one program required the actual performance of a chest X-ray, but 45 percent required interpretation of this test, and another 41 percent expected some knowledge of the procedure itself.

Table 6 displays data on the students' ability to perform certain therapeutic procedures. All program directors reported that they required students to perform closed-chest cardiac massage. About two-thirds required students to apply casts, and an additional 34 percent required knowledge of this task. Fifty-eight percent of programs expected students to perform an uncomplicated birth delivery, and an additional 39 percent required at least knowledge of this procedure.

Discussion

The present survey of performance expectations revealed considerable uniformity among programs to prepare students to deal with most of the common patient problems encountered in primary care. As could be expected, the skills most basic to PA education are the clinical history and physical examination. Programs provide training for diagnostic skills in a wide range of primary care illnesses but have somewhat lesser expectations for the management of those same illnesses. This finding is consistent with the expected utiliza-

TABLE 6

Number and Percentage of Physician's Assistant Programs Requiring Students To Initiate Medical Procedures*

Procedures	Can Perform		Has Knowledge of		No Need To Know		No Answer
	No.	Percent	No.	Percent	No.	Percent	No.
Perform closed-chest cardiac massage	32	100	0	0	0	0	1
Tape joints for increased stability	28	88	4	13	0	0	1
Apply casts	21	66	11	34	0	0	1
Instruct about orthopedic exercises	20	63	9	28	3	9	1
Carry out uncomplicated delivery	18	58	12	39	1	3	2
Reduce dislocated finger/toe	14	44	17	53	1	3	1
Measure for diaphragm	10	32	18	58	3	10	2

* Percentage based on the number answering question; total questionnaires answered were 33.

tion of these students as assistants to primary care physicians whereby frequent consultation with and general supervision by the physician is the norm, particularly with regard to therapy.

The finding of a high level of performance expectations in patient and family health education is important. Since these health services have generally been neglected by medicine, physician's assistants with these skills offer an added dimension to medical practice. Similarly, most programs prepare students to provide counseling to patients and families for common mental health and sexual problems. Practitioners with such training add to the ability of a practice to offer comprehensive primary care to its patients.

What emerges from this study is a picture of educational programs that have specific objectives for preparing well-rounded practitioners who can provide comprehensive primary medical care under the supervision of a physician. Certainly, this picture marks a dramatic evolution from the original idea that physician's assistants should receive training mainly technical in orientation (6). Considerable curricular congruence exists among programs for physician's assistants.

Most PA programs are either based in or are affiliated with a medical school. In view of the history and conceptual framework of the physician's assistant concept, it is not surprising that PA education is based on and continues to draw extensively on medical education.

References

1. KANE, R., WOOLLEY, F. R., and KANE, R. Toward Defining the End Product of Medical Education. *J. Med. Educ.*, **48**:615–624, 1973.
2. WESTBERG, J., LEFEVER, D., and JASON, H. Clinical Teaching in Physician's Assistant Training Programs. *J. Med. Educ.*, **55**:173–180, 1980.
3. PERRY, H. B., and BREITNER, D. *Physician Assistants: Their Contribution to Health Care.* New York: Human Sciences Press, 1982, Pp. 142–143.
4. Council on Allied Health Education and Accreditation. Essentials of an Approved Educational Program for the Assistant to the Primary Care Physician. In *Allied Health Education Directory* (Ninth Edition). Chicago: American Medical Association, 1980, Pp. 101–104.
5. FISHER, D., and FAULMAN, J. *The Development of Standards to Ensure the Competency of Physician Assistants: Role Definition for the Physician Assistant* (No. HRA 231.760053). Washington, D.C.: U.S. Department of Health and Human Services, 1979.
6. STEAD, E. Conserving Costly Talents—Providing Physicians' New Assistants. *J.A.M.A.*, **198**:182–183, 1966.

DATAGRAM

Results of the NRMP for 1983

The number of U.S. graduates (USG) who enrolled in the National Resident Matching Program (NRMP) in 1983 decreased by 235 from a year ago (1). The percentage of the class who enrolled is approximately the same as last year because of the decrease in the number of graduates that resulted from the change from a three- to a four-year curriculum. The number who subsequently withdrew was also virtually unchanged (Table 1). The proportion who were unmatched decreased from 7.9 to 7.8 percent. Among the other U.S. and Canadian citizens, the number of "fifth pathway" applicants decreased from 528 to 447; 430 participated in the match, and 74 percent were successful, compared with 81 percent of the osteopathic graduates, 57 percent of the physician applicants, and 49 percent of U.S. citizen foreign medical graduates.

TABLE 1

Participation in the National Resident Matching Program in 1983

Category	U.S. Senior Students		Other U.S. and Canadian Citizens*		Alien Foreign Graduates		Total Applicants	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Applicants	15,553	100	3,925	100	5,422	100	24,900	100
Withdrew	1,584	10	1,468	37	1,804	33	4,856	20
Active participants	13,969	90	2,457	63	3,618	67	20,044	80
Matched	12,874	92	1,395	57	949	26	15,218	76
Unmatched	1,095	8	1,062	43	2,669	74	4,826	24
Total	13,969	100	2,457	100	3,618	100	20,044	100

* Other U.S. and Canadian citizens include graduating students from U.S. osteopathic schools and Canadian medical schools; physician candidates, that is, U.S. graduates who did not enter graduate medical education directly from medical school; "fifth pathway" students, who are U.S. nationals who completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship; and U.S. foreign medical graduates.

The number of graduates of foreign medical schools (FMG) who applied increased by 2,558. Of the 7,410 who applied, 1,988 were U.S. citizens; the number of U.S. FMG increased by 47 percentage points, and the number of alien FMG by 55 percentage points. Only 26 percent of alien FMG obtained a position.

The total number of U.S.-Canadian citizens (U.S. graduates, "fifth pathway" students, U.S. FMG, and osteopathic and Canadian graduates) who applied to the match this year increased by 15 percent.

The number of positions offered for the first postgraduate year decreased by 348; 33 fewer were offered to the generalist* specialties than in 1982 (Table 2). The ratio of positions per applicant was 0.7; that of positions per U.S.-Canadian citizen applicant was 0.9 and that per U.S. graduate was 1.15; the ratios for active applicants in the match were, respectively, 0.89, 1.09, and 1.29.

The overall filling of positions increased by 3 percentage points; the filling of positions by U.S. graduates increased by 1 percentage point, and the filling of other applicants increased by 2 percentage points. The most competitive programs were in emergency medicine, which was offered in the match for the first time this year, obstetrics, orthopedic surgery, and otolaryngology; in all of these, over 90 percent of the positions were filled.

Seventy-six fewer USG entered family practice programs than in 1982, and the filling of total positions decreased by 1 percentage point despite an increase of 135 in the number of other graduates who matched. Internal medi-

---

* "Generalist" specialties are defined as family practice, internal medicine, obstetrics, and pediatrics.

TABLE 2

Positions Offered and Filled by Specialty and Type of Applicants in the NRMP in 1983

Specialties	Positions Offered		Applicants Matched												
			U.S. Senior Students			Other U.S. and Canadian Citizens‡			Alien Foreign Graduates			Total Applicants			
	No.	Percent*	No.	Percent		No.	Percent		No.	Percent		No.	Percent		
				*	†		*	†		*	†		*	†	
Family practice	2,353	13	1,681	13	71	173	12	7	42	4	2	1,896	12	81	
Internal medicine	6,276	35	4,511	35	72	525	38	8	379	40	6	5,415	36	86	
Pediatrics	1,795	10	1,182	9	66	99	7	6	238	25	13	1,519	10	85	
Obstetrics/Gynecology	1,010	6	807	6	80	136	10	13	20	2	2	963	6	95	
Psychiatry	867	5	496	4	57	49	4	6	64	7	7	609	4	70	
Medical specialties	97	1	57	0	59	5	0	5	2	0	2	64	0	66	
Dermatology	6		6		100	0		0	0		0	6		100	
Neurology	67		34		51	3		4	1		1	38		57	
Ophthalmology	24		17		71	2		8	1		4	20		83	
General surgery	2,274	13	1,711	13	75	216	15	9	84	9	4	2,011	13	88	
Surgical specialties	554	3	485	4	88	38	3	7	5	1	1	528	3	95	
Neurosurgery	48		40		83	1		2	1		2	42		88	
Orthopedics	318		291		92	21		7	2		1	314		99	
Otolaryngology	81		72		89	7		9	1		1	80		99	
Urology	104		80		77	9		9	1		1	90		87	
Plastic surgery	3		2		67	0		0	0		0	2		67	
Support specialties	1,558	9	1,085	8	70	86	6	6	63	7	4	1,234	8	79	
Anesthesiology	437		332		76	18		4	12		3	362		83	
Emergency medicine	190		168		88	19		10	2		1	189		99	
Pathology	484		265		55	26		5	35		7	326		67	
Physical medicine	92		56		61	4		4	4		4	64		70	
Diagnostic radiology	292		250		86	19		7	2		1	271		93	
Therapeutic radiology	52		14		27	0		0	8		15	22		42	
Nuclear medicine	11		0		0	0		0	0		0	0		0	
Transitional	1,168	7	859	7	74	68	5	6	52	5	4	979	6	84	
Total	17,952	100	12,874	100	72	1,395	100	8	949	100	5	15,218	100	85	

* Percent distributions of positions offered and filled among specialties (percentage may not add because of rounding).

† Percent of positions offered in specialty that were filled by applicants.

‡ See Table 1 footnote.

cine attracted 27 more USG than last year, and the filling of total positions increased by 2 percentage points despite the offering of 16 more positions, also because of the number of non-USG who matched.

In pediatrics, general surgery, and psychiatry, the numbers of positions offered decreased; and, with the exception of pediatrics, the numbers of USG who entered them also decreased. Fewer positions were offered in the new transitional programs than in the flexible programs they replaced, but the percentage filling was unchanged.

The participation of programs and positions in orthopedic surgery again increased. Only a few programs in nuclear medicine and plastic surgery again participated in the match.

The distribution of matched USG among types of programs increased somewhat in internal medicine. A small increase in the percentage of all applicants matched occurred in internal medicine and the support specialties, and decreases occurred in general surgery and transitional programs.

Several specialty matches for physician candidates were carried out by the NRMP in 1982. In the summer, 95 programs offered 228 positions for fellowships in respiratory disease; 191 physicians matched to 84 percent of these positions. In the fall, 22 programs offered 42 positions in colon and rectal surgery, of which 90 percent were filled. Late in the fall, 34 programs in emergency medicine offered 201 positions; 100 percent of them were filled with physician applicants.

Data that describe the trends in numbers of positions offered and filled by U.S. graduates and other applicants during the past several years are included in the 1983 *NRMP Directory* (2).

JOHN S. GRAETTINGER, M.D., *executive vice president, National Resident Matching Program; associate dean for graduate medical education, Rush-Presbyterian-St. Luke's Medical Center; and professor of medicine, Rush Medical College, Chicago.*

References

1. GRAETTINGER, J. S. Results of the NRMP for 1982. *J. Med. Educ.*, **57**:420–422, 1982.
2. *NRMP Directory: Including Hospitals and Programs Participating in the Matching Program for 1983.* Evanston, Illinois: National Resident Matching Program, 1982, Pp. 17–27.

Vol. 58 No. 6 June 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Career Development of Female and Male Physicians
Judith Lorber and Martha Ecker

Peer Review of Teaching in Medicine
David M. Irby

Educational Contracts: A Basis for Effective Clinical Teaching
Dan Pratt and Michael K. Magill

Increasing Physicians' Antismoking Influence by Applying an Inexpensive Feedback Technique
Craig K. Ewart, Virginia C. Li, and Thomas J. Coates

Usefulness of Videotape Instruction in an Academic Department of Neurology
David M. Kaufman and Rita G. Kaufman

Supplement

Preparation in Undergraduate Medical Education for Improved Geriatric Care

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 6 • June 1983

Career Development of Female and Male Physicians—Judith Lorber and Martha Ecker 447

Peer Review of Teaching in Medicine—David M. Irby 457

Educational Contracts: A Basis for Effective Clinical Teaching—Dan Pratt and Michael K. Magill 462

Increasing Physicians' Antismoking Influence by Applying an Inexpensive Feedback Technique—Craig K. Ewart, Virginia C. Li, and Thomas J. Coates 468

Usefulness of Videotape Instruction in an Academic Department of Neurology—David M. Kaufman and Rita G. Kaufman 474

Communications: **The Grading System as a Factor in the Selection of Residents**—Richard L. Hughes, Melton E. Golmon, and Roy Patterson 479

The Organization of a Teaching Nursing Home: An Eight-Year Experience—Marvin Garrell 482

Student Learning on a Pediatric Clerkship—Larrie W. Greenberg and Leslie S. Jewett 484

Selection Biases Versus Training in the Psychosocial Aspects of Primary Care—Wayne D. Mitchell and Troy L. Thompson, II 487

The Development of Professional Identity in the Family Practice Resident—Nellie P. Grose, Thelma Jean Goodrich, and Danita Czyzewski 489

Editorial: Preparing Future Physicians To Care for an Aging Population 492

Bibliography 493

Letter to the Editor 498

Supplement: Preparation in Undergraduate Medical Education for Improved Geriatric Care 501

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

Career Development of Female and Male Physicians

Judith Lorber, Ph.D., and Martha Ecker, Ph.D.

Abstract—In this article, the authors compare the career development of female and male physicians who were graduated from medical school in 1960 and followed through 1976. Working with a sample matched for type and location of medical school and admission test scores, the authors analyzed the effects of achievement motivation, performance in medical school, peer evaluation, prestige of internship hospital, and family responsibilities on professional attainment. The findings indicate that the careers of male physicians build in a sustained way, with the input factors during and following medical school remaining consistent in their effects; in the careers of female physicians, factors crosscut each other, with some being positive and some negative in their effect on professional attainment. Family responsibility is not the only negative factor for women, and this indicates that other elements in career development that help men do not similarly contribute to the advancement of women physicians. A strong positive factor for women is prestige of internship hospital.

Women come to medical school with good qualifications and do well during training (1), but their professional attainment is considerably less than that of male physicians, both in medical academia and in practice (2). While not everyone seeks the highest levels of professional success, when women and men are equally productive, there is serious question as to whether the "payoff" is the same. Cole's study (3) of academically employed women in biology, chemistry, psychology, and sociology, which controlled for quantity and quality of publication, found that women of equal productivity were less likely than men to be promoted, especially at the higher levels. In a study which used data from four medical schools located in different parts of the country, Wallis and colleagues (4) found that it tended to take twice as many years of service for women as for men to be promoted.

Although the proportion of women students in U. S. medical schools has reached approximately 25 percent, there is no guarantee that increased numbers will enhance women physicians' career development. Data from fields where the proportion of women doctorates ranges from 2 percent to almost 50 percent show discrepancies of salary and rank when women are compared with men of equivalent education, experience, field, and type of employment (5). As for affirmative action effects, the Ahern and Scott study, done under the auspices of the National Research Council of the National Academy of Sciences, found in 1981 that there had been no

---

The research reported here was supported by grant 13650 from the Professional Staff Congress-City University of New York Research Award Program.

Dr. Lorber is professor of sociology at Brooklyn College and the Graduate Center, City University of New York, New York City. Dr. Ecker is a fellow in the Training Grant Program on the Economics and Sociology of Women and Work at the City University of New York Graduate Center.

striking changes since 1970 in the disadvantages of women who held doctorates in obtaining employment, in promotions, or in salaries (5).

The lag of professional women in career development is conventionally attributed to their family responsibilities. There is some evidence that attribution rather than reality is at issue. The National Research Council study found that only one woman Ph.D. in 10 with young children dropped out of the labor force and that less than half had children. Furthermore, unmarried women or those without children did not do any better in promotions than married women with children. Heins' study of Detroit women physicians (6) found that despite family responsibilities they were virtually as productive as their male peers, and Mandelbaum (7) found that perceptions and commitments were more important factors in the career persistence of women physicians than the actual extent of family responsibilities.

Another factor often said to contribute to women professionals' lesser attainment is the lack of achievement motivation, or "fear of success" (8). However, an extensive body of research has documented that fear of success because of the social opprobrium it may bring is by no means a universal phenomenon among bright women (9).

In an attempt to determine the effects of early "input" factors, plus family responsibilities, on later professional attainment, the authors in this article compare the career development of female and male physicians who were graduated from medical school in 1960 and followed through 1976. Working with a sample of females and males matched for type and location of medical school and admission test scores, the authors analyzed the effects of achievement motivation, performance in medical school, peer evaluation, prestige of internship hospital, and family responsibilities on professional attainment.

Research Design

The data used in the study were derived from the Association of American Medical Colleges' (AAMC) Longitudinal Study of Medical School Graduates of 1960, hereafter called the AAMC survey (10). The original set of student respondents came from a stratified sample of U.S. four-year medical schools that excluded "special-mission" schools (Pennsylvania Medical College for Women, Howard, Meharry, and Loma Linda). (The schools were grouped by geographical region [Northeast, Southeast, North Central, South Central, West] and by financial support [public and private], thus giving 10 cells out of which 77 medical schools were chosen on the basis of their students' average scores on the Medical College Admission Test [MCAT] and the schools' willingness to participate.) The subjects were surveyed from the point of entry into medical school, in 1956, until 1976, or 16 years after their expected graduation. The original sample consisted of 2,821 respondents, of whom 156 were women. The final number of respondents, as of 1976, was 1,750 men and 100 women.

For the present study, the 100 female physicians who responded to the 1976 longitudinal survey questionnaire were matched with 300 male physicians, a number sufficient for stable estimates of gender differences. The following characteristics were used for matching: type of medical school attended (public or private), geographic region of medical school (Northeast, Southeast, North Central, South Central, and West), and MCAT scores (Verbal Ability, Quantitative Ability, General Information, Science). The MCAT scores were collapsed into one variable on the basis of the median scores of female respondents. The combination of school attended and the MCAT scores permitted equitable matching of the initial status of men and women in the sample, because it is likely that women with higher MCAT scores would have graduated from tax-supported medical schools in larger proportions than their male counterparts since they could not get into private medical schools. Matching on both school and MCAT scores at the same time also evens out the effect of school attended as it interacts with the achievement potential of the student (11). The final sample used in the study consisted of 97 women and 291 men, since there were no males with matching characteristics for three of the women.

There were no data on the race of the respondents, but the elimination of the black medical schools implied that most of the subjects were white. If the respondents were in their early 20s when they entered medical school in 1956 (there were few late starters at that time), then it can be assumed that most were in their early 40s in 1976. The other social and professional characteristics of this sample in 1976 are summarized in Table 1.

INDEPENDENT VARIABLES

The independent variables used in the analysis were: Edwards Personal Preference Schedule (EPPS) scores on achievement motivation (12), mean scale scores on the Part II examination of the National Board of Medical Examiners (NBME), junior-year accomplishment report rating, evaluation of peers concerning the potential to become an outstanding member of the profession, prestige of internship hospital, and score on an index of family responsibilities.

The EPPS measure of achievement motivation is summarized by the following description of this factor (13):

> To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve problems and puzzles, to be able to do things better than others, to write a great novel or play.

In this study, the dichotomized factor scores are used as an indicator of the extent to which the subjects began their medical careers with ambitious goals.

The junior-year accomplishment report rating is based on both faculty evaluations of each respondent and objective tests which vary from school to school. Respondents were rated on their standing in their class: bottom third, middle third, top third. This variable and the dichotomized NBME test scores are measures of performance in medical school.

The evaluation of peers indicates a recognition and support of career development by future colleagues. In the study reported here, the evaluation by medical school peers in 1958, on whether the respondent had the potential to become an outstanding member of the profession, was used as an indicator of such potential encouragement or discouragement of professional attainment. The variable is a dichotomization of the mean rating scores given to each respondent by 10 of the respondent's peers.

The prestige of internship hospital is an important determinant of career development in that it offers novice physicians opportunities for future hospital staff appointments, office partnerships, and referrals. In this study, the prestige of internship hospital score was based on evaluations of hospitals in 1959 by the Council of Medical Education and Hospitals. A hospital self-designated as a major unit in the school's teaching program was given a high prestige rating. All other hospitals not evaluated as major teaching facilities received a low prestige score on the dichotomized prestige scale.

The index of family responsibility differed by gender. Female physicians were asked more specific questions about the effect of family structure on career development than were male respondents. The family responsibility index for females consisted of the following variables: mari-

TABLE 1

Social and Professional Characteristics of Matched Sample of Physicians Responding to 1976 AAMC Longitudinal Survey of Class of 1960

Characteristic	Males		Females	
	No.	Percent	No.	Percent
Marital Status				
Married	257	88.6	61	62.9
Divorced or separated	22	7.6	14	14.4
Widowed	3	1.0	4	4.1
Never married	8	2.8	18	18.6
Number of Children				
0	17	5.9	27	27.8
1	18	6.2	8	8.2
2	78	27.0	26	26.8
3+	176	60.9	36	37.1
Type of Practice				
Fee-for-service	174	64.7	33	41.2
Salaried	59	21.9	41	51.2
Shared group	13	4.8	3	3.8
Contract	10	3.7	1	1.3
Other	13	4.8	2	2.5

tal status, number of children, and responsibility for housework. The index of family responsibility for female physicians ranged from 0, indicating never married and no children, to 4, indicating married with three or more children and having primary responsibility for housework. Questions on responsibility for housework were not asked of male respondents; therefore, the index of family responsibility for male physicians, which ranged from 0 to 3, represented their marital status and number of children. For the women, the scores were trichotomized as follows: low (0 and 1), medium (2), and high (3 and 4). For the men, the scores were low (0 and 1), medium (2), and high (3).

The gender breakdown on each of the independent variables is shown in Table 2. It may be noted that, as a group, the women began with considerably lower achievement motivation than the men, but their medical school performance, as measured by NBME test scores and junior-year accomplishment reports, was practically equivalent. However, despite their comparable performance in medical school, men and women respondents were rated quite differently by their peers, with a far lower percentage of women being considered likely to become an outstanding member of the profession. Nonetheless, women who went on for internships were more likely than men to be found at a high prestige hospital. Although women were likely to have responsibility for household management, as measured by marital status and number of children, men had a higher degree of family responsibility. The important question and the one explored in the study was how these factors built on each other and interacted. The authors, therefore, examined their combined and separate effects on the professional attainment of female and male physicians.

PROFESSIONAL ATTAINMENT

An index of professional attainment, the dependent variable, was constructed with the following indicators each contributing one point: board certification, publication of articles in professional journals within the previous five years, presentation of

TABLE 2

Scores on Independent Variables for Matched Sample of Respondents to AAMC Longitudinal Survey of Class of 1960

Variable*	Males		Females		Total	
	No.	Percent	No.	Percent	No.	Percent
EPPS†						
Low score	115	39.9	50	51.5	165	42.9
High score	173	60.1	47	48.5	220	57.1
NBME Examination						
Low score	117	49.6	40	52.6	157	50.3
High score	119	50.4	36	47.4	155	49.7
Junior-Year Accomplishment						
Bottom third of cohort	79	28.5	25	29.4	104	28.7
Middle third of cohort	104	37.5	32	37.6	136	37.6
Top third of cohort	94	33.9	28	32.9	122	33.7
Peer Evaluations‡						
Low	143	52.4	61	67.0	204	56.0
High	130	47.6	30	32.9	160	44.0
Prestige of Hospital§						
Low	111	43.4	23	27.7	134	39.5
High	145	56.6	60	72.3	205	60.5
Degree of Family Responsibility						
Low	19	6.5	25	25.8	44	11.3
Medium	96	33.0	23	23.7	119	30.7
High	176	60.5	49	50.5	225	58.0

* Significance test = Eta coefficient.
† Significance = .02.
‡ Significance = .007.
§ Significance = .01.

papers before professional groups, administration and/or conduct of research studies, development of medical or surgical procedures within the previous five years, offices held in professional organizations, service on professional committees, over 50 percent of patients referred to the respondent by a physician outside of the respondent's own specialty, over 50 percent of patients referred to the respondent by a physician within the respondent's own specialty, associate or full professor rank, and formal administrative position. These indicators, which are correlated with but not substitutable for each other, were chosen from the 1976 follow-up questionnaire to measure professional attainment in either entrepreneurial or academic careers, as it was impossible to identify type of career from the available data.

The scores were trichotomized as low (0 to 3), moderate (4 to 6), and high (7 to 11). As can be seen from Table 3, women physicians were significantly less likely to have a high attainment level at the middle stage of their careers. Since professional attainments tend to accumulate, it can be predicted that those with high levels of attainment will continue at that level and that the discrepancy between men and women will continue.

Path Analysis

The path analysis derived from the dependent variable and the independent variables yields models of career development which indicate how early advantages (ambition, good performance in medical

TABLE 3

Professional Attainment as of 1976 of a Matched Sample of Physician Respondents to AAMC Longitudinal Survey of Class of 1960

Attainment*	Males		Females		Total	
	No.	Percent	No.	Percent	No.	Percent
Low	110	37.8	40	41.2	150	38.7
Moderate	112	38.5	37	38.1	149	38.4
High	69	23.7	20	20.6	89	22.9

* Significance = .0015. Significance test = Eta coefficient.

school, peer encouragement, and prestigious internship) are modified by gender and family responsibilities to affect female and male physicians' career development. The introduction of the predictive variables (EPPS scores on achievement motivation, mean score on NBME examinations, junior-year accomplishment report rating, peer evaluations of respondents concerning potential to become outstanding members of the profession, prestige of internship hospital, and degree of family responsibility) was based on the time order in which each was expected to affect career development and professional attainment.

MALES

Analysis of the path model of career development of male physicians indicated a consistent progression in the impact of all of the independent variables (Figure 1). EPPS scores on achievement motivation had a direct and significant impact on NBME scores ($B = .13$). Both junior-year accomplishment report ratings and scores on NBME examinations had a direct and significant effect on peer evaluations ($B = .28$ and $B = .17$ respectively). Peer evaluations had a significant impact on the prestige of internship hospital attended ($B = .12$). The prestige of internship hospital had a direct and significant impact on status attainment ($B = .15$). NBME test score had a negative significant effect on family responsibility ($B = -.16$), but family responsibility had a negligible effect on attainment.

The independent variables with a direct effect on the professional attainment of male physicians were EPPS achievement motivation ($B = .13$), mean score on NBME examinations ($B = .16$), and prestige of internship hospital ($B = .15$). Thus, for men early ambition was able to be

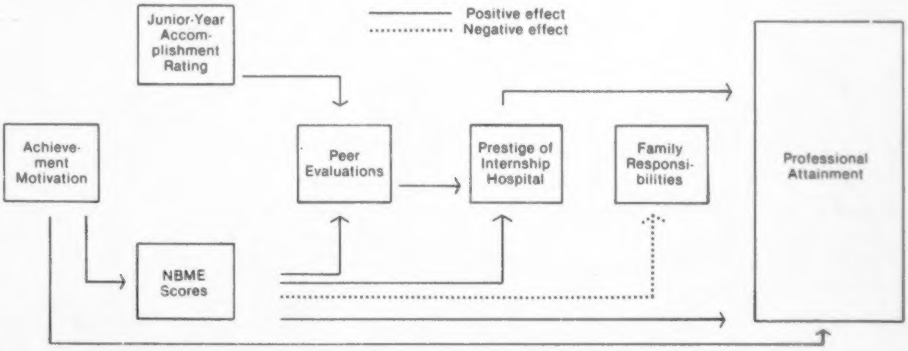


FIGURE 1
Path model of significant variables in male physicians' career development.

translated into good performance in medical school, which in turn contributed to a prestigious internship. Professional attainment for male physicians, in terms of these variables, was a combination of ambition, performance, and training location. However, it should be noted that the path model of professional attainment of male physicians explained only 13 percent of the variance.

FEMALES

Analysis of the path model of career development of female physicians indicated fewer significant input factors and a lack of consistent, progressive impact of the variables on professional attainment (Figure 2). Achievement motivation had a significant effect ($B = .21$) on the evaluation of medical school peers as to whether the respondent would become an outstanding member of the profession. However, peer evaluation had no effect on any other input variables or on professional attainment. NBME examination score ($B = .23$) and prestige of internship hospital ($B = .19$) each had a direct, positive, and significant effect on females' professional attainment, but NBME test score did not significantly influence prestige of internship hospital. As might be expected, family responsibility had a significant but negative impact on professional attainment for women physicians ($B = -.25$); but unlike men, the degree of family responsibility was not significantly related to medical school performance. The entire path model of professional attainment for women physicians explained only 14 percent of the variance.

MALES AND FEMALES COMPARED

For comparison of the differences in the effects of the predictors of professional attainment for male and female physicians, an examination of the unstandardized scores of the variables was undertaken (Table 4).

To begin with the effect of personality traits, achievement motivation was a comparatively better predictor of professional attainment for male physicians ($b = .32$) than for female physicians ($b = .12$). On performance, the effects of the two variables, score on NBME examinations and junior-year accomplishment report, were consistent for men but contradictory for women. NBME test score was a significant factor of professional attainment for both, but a much better predictor for males ($b = .98$) than for females ($b = .13$). Rating on the junior-year accomplishment report had a contrasting effect. Although not a significant factor in the analysis, this performance variable had a positive impact on the professional attainment of male

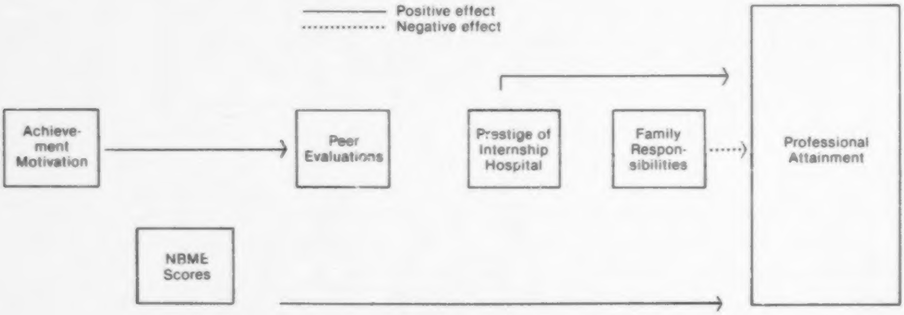


FIGURE 2
Path model of significant variables in female physicians' career development.

TABLE 4

Direct Effect of Predictors on Professional Attainment as of 1976 of Matched Sample of Respondents to AAMC Longitudinal Survey of Class of 1960

Predictors	Female Physicians' Professional Attainment		Male Physicians' Professional Attainment	
	b	Beta	*b*	Beta
EPPS Score	.12	.05	.32*	.13*
NBME Examination Mean Score	.13*	.23*	.98*	.16*
Junior-Year Accomplishment Report Rating	−.22	−.07	.30	.10
Peer Evaluations	.21	.04	.13	.04
Prestige of Internship Hospital	1.12*	.19*	.78*	.15*
Degree of Family Responsibility	−.61*	−.25*	.22	.06

* Significant at .05 level. Significance test = *F* test.

physicians ($b = .30$) but a negative impact on females ($b = -.22$). Peer evaluations of respondents concerning potential to become outstanding members of the medical profession had a slightly better predictive value for female ($b = .21$) than for male physicians ($b = .13$).

Unlike medical school performance, the prestige of internship hospital did make a difference for women physicians' careers. This variable was a significant predictor of professional status attainment for all physicians, but it had a much stronger impact for women ($b = 1.12$) than it did for men ($b = .78$). This finding suggested that training location was even more important to the career development of women, who are in the minority in the medical profession, than to men.

As might be expected, a high degree of family responsibility had a significant and negative effect on the professional attainment of women physicians ($b = -.61$) and much less effect and a positive one on men ($b = .22$).

Discussion

In the assessment of the findings reported in this article, it must be kept in mind that only a small proportion of the variance in professional attainment, for both men and women, is explained by achievement motivation, medical school performance, peer evaluation during medical school, prestige of internship hospital, and family responsibilities. Much of the important informal aspect of career advancement is missing from these models, particularly the help that established physicians extend to novices in hospital appointments, practice arrangements, referrals, and consultations (14). However, the predictor variables were chosen because they are usually cited as the reasons for the differentials between female and male professional attainment. Thus, it is worth reviewing which variables do and do not affect career development for men and women physicians.

Two variables, achievement motivation and performance in medical school, are better predictors of professional attainment for men than for women. It should be noted that these are the only factors somewhat under the individual's control, and, therefore, their low effect on women physicians' career development in a sense absolves the women themselves of personal responsibility for their lesser professional attainment.

The most obvious barrier for women, family responsibilities, is not under their control unless they choose not to marry or, if married, remain childless. Otherwise, the distribution of family responsibilities must be negotiated with their husbands and is also dependent on the availability of reliable external sources of domestic help. Although there is some indication that men are diminishing their intense career commitment and increasing their level of family involvement and women are going in the opposite direction (15, 16), there is little indication of a convergence and a truly equalitarian division of responsibility in the dual-career marriages of women physicians (17). Women still tend to be held responsible for running the household and for supervising child care, regardless of their level of professional commitment. Without a concerted effort to change these social patterns, those women physicians who would like to achieve a high level of success will probably continue to experience this hindrance to their professional attainment.

One factor that clearly contributes to female physicians' professional attainment is prestige of internship hospital. Training location has been singled out as an important factor in males' career advancement, since it is the source of contacts for future appointments, affiliations, and referrals (11, 14). Interviews with women physicians revealed that they were able to obtain sponsorship during training but found it difficult to obtain such support for their career advancement once they had completed their medical education (18).

The research reported here supports the significance to women of prestigious graduate medical education, and suggests that a special effort should be made to assign women who have performed well in medical school to postgraduate programs that will enhance their visibility and offer superior opportunities for research, further training, and referrals. Since women's gender status has tended to undercut their professional status, it is particularly important that they are offered a way of enhancing their professional status.

References

1. HOLMES, F. F., HOLMES, G. E., and HASSANEIN, R. Performance of Male and Female Medical Students in a Medical Clerkship. *J.A.M.A.*, **239:**2259–2262, 1978.
2. WILSON, M. P. The Status of Women in Medicine: Background Data. *J. Am. Med. Wom. Assoc.*, **36:**62–79, 1981.
3. COLE, J. R. *Fair Science: Women in the Scientific Community.* New York: Free Press, 1979.
4. WALLIS, L. A., GILDER, H., and THALER, H. Advancement of Men and Women in Medical Academia: A Pilot Study. *J.A.M.A.*, **246:**2350–2353, 1981.
5. AHERN, N. C., and SCOTT, E. L. *Career Outcomes in a Matched Sample of Men and Women Ph.D.s: An Analytical Report.* Washington, D.C.: National Academy Press, 1981.
6. HEINS, M., SMOCK, S., MARTINDALE, L., JACOBS, J., and STEIN, M. Comparison of the Productivity of Women and Men Physicians. *J.A.M.A.*, **237:**2514–2517, 1977.
7. MANDELBAUM, D. R. *Work, Marriage and Motherhood: The Career Persistence of Female Physicians.* New York: Praeger, 1981.
8. HORNER, M. S. Toward an Understanding of Achievement-Related Conflicts in Women. *J. Soc. Issues*, **28:**157–176, 1972.
9. TRESEMER, D. The Cumulative Record of Research on "Fear of Success." *Sex Roles*, **2:**217–236, 1976.
10. ERDMANN, J. B., JONES, R. F., and TONESK, X. *AAMC Longitudinal Study of Medical School Graduates of 1960* (DHEW Publication No. 79-3235). Hyattsville, Maryland: National Center for Health Services Research, 1979.
11. MARSHALL, R. J., FULTON, J. P., and WESSEN, A. F. Physician Career Outcomes and the Process of Medical Education. *J. Health Soc. Behav.*, **19:**124–138, 1978.
12. EDWARDS, A. L. *Edwards Personal Preference Schedule.* New York: Psychological Corporation, 1953.
13. EDWARDS, A. L. *Manual for the EPPS* (Revised). New York: Psychological Corporation, 1959.
14. HALL, O. The Informal Organization of the Medical Profession. In *Medical Care.* R. Scott and E. H. Volkart (Eds.). New York: Wiley, 1966, Pp. 149–163.

15. KUTNER, N. G., and BROGAN, D. R. A Comparison of the Practice Orientations of Women and Men Students at Two Medical Schools. *J. Am. Med. Wom. Assoc.*, **35**:80–86, 1980.
16. NADELSON, C. C., NOTMAN, M. T., and LOWENSTEIN, P. A. Follow-up Study of Harvard Medical School Graduates, 1967–1977. *J. Am. Med. Wom. Assoc.*, **36**:51–62, 1981.
17. LORBER, J. How Physician Spouses Influence Each Other's Careers. *J. Am. Med. Wom. Assoc.*, **37**:21–26, 1982.
18. LORBER, J. The Limits of Sponsorship for Women Physicians. *J. Am. Med. Wom. Assoc.*, **36**:329–338, 1981.

Vol. 58 No. 7 July 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Factors Influencing Program Selection Among Family Practice Residents
Robert A. DiTomasso, James P. DeLauro, and S. Thomas Carter, Jr.

Women as Physicians
Carola Eisenberg

Availability of Personal Counseling in Medical Schools
Richard D. Seigle, Marc A. Schuckit, and Diane Plumb

The Timing of Career Decisions in Internal Medicine
Joe W. Ramsdell

Medical Education in the People's Republic of China
Donald O. Nutter

Suicide Management Skills and the Medical Student
Robert A. Neimeyer and Ronald J. Diamond

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 7 • July 1983

Factors Influencing Program Selection Among Family Practice Residents—Robert A. DiTomasso, James P. DeLauro, and S. Thomas Carter, Jr. 527

Women as Physicians—Carola Eisenberg 534

Availability of Personal Counseling in Medical Schools—Richard D. Seigle, Marc A. Schuckit, and Diane Plumb 542

The Timing of Career Decisions in Internal Medicine—Joe W. Ramsdell 547

Medical Education in the People's Republic of China—Donald O. Nutter 555

Suicide Management Skills and the Medical Student—Robert A. Neimeyer and Ronald J. Diamond 562

Retention of Cardiopulmonary Resuscitation Skills by Medical Students—Michael Fossel, Robert Todd Kiskaddon, and George L. Sternbach 568

Adult Immunization: The Medical Record Design as a Facilitator for Physician Compliance—William MacMillan Rodney, Peter Chopivsky, and Martin Quan 576

Communications: **Simple Adding Versus Differential Weighting of MCAT Subtest Scores**—Michael B. Donnelly, Daniel S. Fleisher, Sally Y. Long, Chao-Yuan Chen, and Paul S. Rosenfeld 581

- **Training Internal Medicine Residents in Geriatrics**—Gisele P. Wolf-Klein, Leslie S. Libow, Cornelius J. Foley, and Felix A. Silverstone 583
- **Computer Analysis of Residency Training**—Frank A. Simon 585
- **Family Medicine: Reassessment of Two Educational Objectives**—Danis J. Christensen 587
- **Briefs** 589

Editorial: Integrity in Medical Education 591

Bibliography 592

Letter to the Editor 599

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Indiana University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

Factors Influencing Program Selection Among Family Practice Residents

Robert A. DiTomasso, Ph.D., James P. DeLauro, Ph.D., and S. Thomas Carter, Jr., M.D.

Abstract—Factors on which family practice residents base their judgments about ranking programs are identified. Questionnaires were mailed to 1,810 first-year family practice residents who participated in the 1981 matching program; 830 (46 percent) responded. The questionnaire items were factor analyzed, and nine factors accounting for 59.4 percent of the variance emerged. Reliability for the questionnaire was estimated to be .82 using coefficient alpha. Factor scores for the nine subscales were computed and employed as dependent variables in several multivariate analyses of variance. Significant differences for sex, age, race, and geographical region were found on various factors; these findings indicated differences in what those groups considered important when selecting a residency.

In the field of graduate medical education, the "Ides of March" has acquired particular significance, for March 15 is the day when the results of the National Resident Matching Program (NRMP) are received throughout the country. The match represents the culmination of a complex decision-making process for both students and the residency program faculties. How do applicants eventually decide what programs to rank? Such choices are probably highly personal. Nonetheless, several variables influencing the rankings have been suggested.

From the perspective of the applicant, Ness and Weiler (1) pointed to their own difficulty in obtaining information from residency programs upon which a decision could be made. In advising students on what to ask when evaluating a house officership, Raff and Schwartz (2) drew up an extensive list of questions pertaining to hospital facilities, work load, patient mix, learning experiences, ancillary services, personal financial matters, continuity of training, and impression of current house staff members.

A recent review of the literature on factors which influence applicants' rankings of residency programs revealed that very little empirical data had been published on the topic. In one study (3), 108 applicants for internships in a municipal hospital's internal medicine program were surveyed in an attempt to identify the particular aspects of the program that affected their rankings. A statistically sig-

---

Dr. DiTomasso is assistant director for behavioral medicine, Dr. DeLauro is director of the Office of Education and Research, and Dr. Carter is director, all of the West Jersey Health System Family Practice Residency at the West Jersey Hospital, Voorhees, New Jersey. Dr. DiTomasso also is a lecturer in the Psychology in Education Division, University of Pennsylvania, Philadelphia, and Dr. Carter is clinical assistant professor of medicine, University of Pennsylvania School of Medicine.

nificant relationship was found between the rank assigned to a program and the depth of the interns' responsibility, the socioeconomic class of patients, and personal reasons. The type of hospital in which a program is located must also be considered an important factor in the ranking process (4).

In a survey of 33 senior students from one medical school who were entering family practice residencies, Eagleson and Tobolic (5) collected data on 11 variables thought to influence the choice of a particular residency program. Similarly, a 1981 survey of graduating medical students performed by the Association of American Medical Colleges asked respondents to rank 18 items according to how much effect each had on their choice of a particular residency.

While previous reports have identified a number of variables thought to be influential in the choice of a residency, none has attempted to survey systematically a large number of family practice residents for that purpose. It is important that faculty members at family practice residencies understand what applicants are looking for when they come to visit so that the prospective resident can be given the information needed to make an informed decision.

The aim of the study reported here was twofold: (*a*) to evaluate the relative importance of 31 items in determining the ranking of programs as reported by family practice residents and (*b*) to discover the underlying factors upon which family practice residents base their judgments about program rankings.

Method

A total of 1,810 first-year family practice residents who participated in the 1981 National Resident Matching Program (NRMP) were asked to respond to a questionnaire. This group consisted of those who were reported as "successfully matched." Responses were received from 830 residents for a return rate of 46 percent. The sample comprised 78 percent males and 22 percent females. The majority (92.3 percent) of the sample was white. The mean age of the respondents was 27.2 years with a standard deviation of 2.8. The average respondent ranked six programs; the range extended from 1 to 16. Sixty-six percent of the respondents reported having obtained their first-ranked program.

The survey questionnaire was developed in two stages. In stage one, items were selected in order to ensure adequate coverage of the universe of variables possibly influencing the ranking process. Items were initially selected for inclusion in the pilot questionnaire on the basis of three criteria. First, discussions with numerous family practice residents were held during which they were asked to generate all possible variables influencing rankings. Second, previous pilot research conducted by the authors on an independent sample of family practice residents provided items. Finally, some items were selected on the basis of previously published research (5) in the area. Items from all of these sources were then used to create the pilot questionnaire. In stage two, the pilot questionnaire was tested on a group of family medicine applicants who interviewed for a first-year position during 1980–1981 at the West Jersey Health System Family Practice Residency, West Jersey Hospital, Voorhees, New Jersey. Item analysis of this questionnaire resulted in the final draft of the questionnaire.

All medical students who participated in the 1981 NRMP and who were currently first-year family practice residents were identified. The survey questionnaire and a self-addressed return envelope were attached to a cover letter inviting participation. Mailings began in early September 1981 and were completed by mid-

TABLE 1

Mean Ratings,* Standard Deviation, and Ranks of Questionnaire Items for 830 First-Year Family Practice Residents

Questionnaire Item	Mean	Deviation	Rank
Quality of family practice faculty	4.30	.76	1
Geographic location of program	4.28	.86	2
Impression of program's residents	4.22	.87	3
Satisfaction level of residents	4.20	.88	4
Patient care responsibilities assumed	4.04	.90	5
Opportunity to see variety of medical problems	4.02	.94	6
Community in which program is located	3.91	.86	7
Hospital facility	3.89	.79	8
Family practice center facility	3.84	.81	9
Impression of residency director	3.76	.97	10
Reputation of program	3.60	1.03	11
Community hospital setting	3.57	1.22	12
Volume of patients	3.56	.98	13
Social climate of center	3.55	1.09	14
Medical curriculum	3.51	1.07	15
Interviews with program faculty	3.47	1.00	16
On-call frequency	3.28	1.09	17
Proximity of program to family	3.21	1.45	18
Setting similarity	3.00	1.24	19
Presence of other residencies	2.96	1.41	20
Behavioral curriculum	2.93	1.17	21
Program's years of existence	2.90	1.11	22
Academic affiliation with a university	2.88	1.20	23
Program's success in previous match	2.87	1.27	24
Opportunity to teach	2.80	1.13	25
Benefits	2.73	1.13	26
Salaries	2.73	1.12	26
Moonlighting opportunities	2.53	1.22	28
Perceived practice opportunities in geographic area	2.39	1.20	29
Recommendation of medical school adviser	2.03	1.19	30
Opportunity to conduct research	1.64	.94	31

* Based upon a Likert rating scale where 1 = not at all important, 2 = a little important, 3 = as important as it was not, 4 = a good deal important, 5 = extremely important.

October. The subjects were asked to rate the importance of 31 variables which might influence the ranks that medical students assign to residency programs. Subjects used a five-point Likert scale where 1 = not at all important, 2 = a little important, 3 = as important as it was not, 4 = a good deal important, and 5 = extremely important.

Results

A mean response score and standard deviation were calculated for each of the items included in the survey questionnaire. The questions were then ranked in order of mean size (Table 1). The six highest ranking items in descending order of importance to residents were: the quality of a residency's faculty, the geographic location of a program, an applicant's impression of a program's current residents, the reported level of satisfaction by a program's current residents, the patient care responsibilities assumed by the program's residents, and the opportunity to see a variety of medical conditions as a resident.

All the items were then subjected to a

TABLE 2

Number of Items, Percent of Variance, and Alpha Reliability Coefficients for Nine Factors Extracted Through Principal Components Factor Analysis from Residency Selection Questionnaire

Factor	No. of Items	Percent of Variance	Coefficient Alpha
Opportunity for experience	4	19.3	.74
Resident compensation	4	8.1	.78
Academic orientation	4	5.7	.54
Quality of educational environment	3	5.5	.63
Stability of the program	4	5.0	.67
Geography	3	4.7	.43
Faculty	2	4.0	.46
Future practice opportunities	3	3.6	.51
Residency curriculum	3	3.5	.57

principal components varimax rotated factor analysis according to Kaiser's criterion. Nine factors were extracted which accounted for 59.4 percent of the variance. Factor 1, labeled "opportunity for experience," measures an applicant's perception of a program's potential for providing adequate experience with respect to patient care, the number of available patients, the variety of patient problems, and the opportunity for clinical teaching. Factor 2 was called "resident compensation." This construct is an indicator of the benefits that a residency offers to a resident and includes salary, vacation, insurance, and on-call frequency. Factor 3 was termed "academic orientation of a program." This factor is comprised of items such as a program's affiliation with a university, the opportunity to conduct research, and the presence of other specialty residencies at a hospital. Factor 4 measures the "quality of the educational environment" and includes the quality of the residency faculty, the family practice center, and the hospital facility. Factor 5 was called the "stability of the program." A program's stability involves its reputation, years of existence, previous success in filling through the match, and an applicant's impression of its residents. Factor 6 is "geography" and is concerned with the part of the country where a program is located, the community in which it is embedded, and the distance between the location and the applicant's relatives and friends. Factor 7 was termed "faculty," which measures an applicant's impression of a residency's director and faculty members. Factor 8 measures the "potential opportunities for future practice" in the geographical area and community as well as the similarity of the setting to an applicant's preference for a practice location. Factor 9 provides a measure of the "residency curriculum." Items loading significantly on this factor include an applicant's evaluation of the medical and psychosocial curricula as well as an evaluation of a program by an adviser at the applicant's medical school.

Reliability of the questionnaire was estimated by coefficient alpha. The obtained reliability coefficient for the survey questionnaire was .82. This value indicates that the instrument is reasonably consistent and reliable. Alpha reliability coefficients were also calculated for each factor (subscale), as shown in Table 2. Reliabilities fell within the moderate range.

Factor scores for the nine subscales were computed and employed as dependent variables in several multivariate analyses of variance (MANOVA). The effects of several independent (demographic) variables, including sex, rank of program, age, racial/ethnic background, and geographical region, were examined in separate analyses. Given the large number of subjects in this study, the practical implications of these results should be weighed carefully. The means and standard deviations of the factor scores are reported in Table 3.

The overall Wilk's criterion for sex was significant at the .0001 level. Post hoc analyses of variance revealed significant sex differences on factors 2 ($F = 17.99$, $p < .0001$), 6 ($F = 6.55$, $p < .01$), 8 ($F = 6.55$, $p < .01$), and 9 ($F = 8.81$, $p < .003$). Males placed significantly more emphasis upon compensation and future practice opportunities in ranking programs than females. On the other hand, females attached significantly more importance to geography and the curricula in the ranking process.

No significant overall main effects were evident between residents in programs of first choice and residents in programs other than their first choice.

The subjects were divided into two groups, younger and older residents. Younger and older residents were operationally defined as 27 years of age and below and 28 years of age and above, respectively. That cut-off age was selected because it generally separates those who have gone directly from undergraduate school to medical school to residency from those who had taken some time between training experiences. The overall MANOVA for age was significant at the .0001 level. Post hoc analyses revealed an age difference on factor 5 ($F = 22.04$, $p < .0001$). Younger residents placed significantly more importance upon the stability of a program than older residents did.

The MANOVA for race revealed a significant Wilk's lambda ($p < .0007$). Post hoc analyses of variance (ANOVAs) indicated significant differences on the race variable for factors 3 ($F = 16.84$, $p < .001$) and 9 ($F = 10.30$, $p < .001$). Minority residents placed significantly more importance than white applicants upon a program's similarity to an academic setting. Minorities also weighed curricula more importantly in ranking programs.

Do graduates of medical schools from

TABLE 3

Mean Factor Score Ratings and Standard Deviations for Demographic Variables*

Variable	No.†	Factors											
		Compensation		Academic Orientation		Stability of Program		Geography		Future Practice Opportunities		Residency Curriculum	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Sex													
Male	645	2.31	.72					2.24	.45	1.81	.50	1.66	.52
Female	181	2.05	.67					2.38	.44	1.70	.53	1.79	.46
Age													
Younger	584					2.78	.58						
Older	246					2.57	.64						
Race													
White	766			2.02	.60							1.67	.52
Minority	64			2.35	.71							1.89	.39

* Only those demographic variables for which significant differences ($p < .05$) were obtained from multivariate analyses of variance are presented here.

† No. refers to the number of subjects within a level of independent variable.

different regions of the country differ in the importance they attribute to the factors when ranking programs? The 10 geographical regions used by the NRMP were compared to assess geographical differences. Significant differences were found on factors 4 ($F = 2.30$, $p < .02$), 5 ($F = 2.76$, $p < .004$), and 9 ($F = 2.79$, $p < .003$). A modified Duncan Multiple Range Test corrected for experiment-wise error rate revealed specific regional differences on each factor. Residents who graduated from medical schools in the northwestern United States viewed the quality of the educational environment as significantly less important than medical graduates from every other region except the mountain region. Residents who received their undergraduate training in the southwestern and southcentral United States and in foreign countries attached significantly less importance to the stability of a program than those trained in the New York-New Jersey, the mideast coast, and the southeastern regions. Finally, students in the southcentral region of the country and those trained in foreign medical schools rated curriculum as significantly less important than those trained in the northwest and southwest.

Discussion

The findings of this study have important implications for medical students and family practice residencies. There is some question about whether students or family practice faculty members were previously aware of the variables reported by residents to influence the process of ranking. The findings, it is hoped, will provide useful data to guide future students in selecting programs. Likewise, residency directors will be able to give applicants the opportunity to evaluate a program along these various dimensions. Hopefully, the findings will make the interviewing and ranking process regarding residencies more efficient.

An examination of the factors reveals that applicants view programs along nine dimensions. These dimensions encompass what could be considered the what, who, and where of residencies. However, it is important to note that the study did not address the relative importance of each factor in the decision-making process.

The "what" of a program includes six dimensions: opportunity for experience, resident compensation, academic orientation of a program, quality of the educational environment, stability of the program, and residency curriculum. Included within each dimension are specific criteria which appear to affect the judgments made by residents.

The question of whether a program can provide a resident with adequate preparatory experiential opportunities is indeed important. By its very nature, a residency is intended to be a program of "experiential" learning. It seems appropriate then that commitment to a program is at least in part based upon a consideration of this factor. Interest in compensatory issues is also easy to understand since most medical students have little or no self-generated income. Residents also appear to assess a program's similarity to academic settings through things such as medical school affiliation and the presence of other specialty residencies at the hospital.

The perceived quality of the educational environment is yet another judgment variable. Subsumed under this dimension are a resident's perceptions about the quality of the faculty and facilities available at a prospective residency. Faculties and facilities, respectively, encompass the social and physical context in which future learning will take place.

The role of faculty members as teachers and models cannot be underestimated. Moreover, poor facilities can seriously undermine learning by precluding valuable opportunities to practice specific procedures. The curriculum provides the underlying educational framework out of which learning objectives are achieved. Finally, there is the stability of a program. Residents appear to consider the probability that the program in question will continue to exist over the next three years.

The "who" of a program is a dimension based upon impressions of the faculty members and the director by applicants obtained through interviews. They apparently weigh who it is that will provide the direct clinical teaching that is so much a part of residency training.

The "where" of a program involves a consideration of what segment of the country a resident prefers, its proximity to significant others, and the type of community in which he will practice during training. Finally, there is also the issue of whether a resident prefers practicing in a particular type of community.

In summary, the residents' survey responses indicate that when making decisions about programs, they would ask the following questions: "What can I expect to learn?" "Where will that learning take place?" "Who will be my teachers?" "Will I be happy in this area?" "Will the program exist for the duration of my training?"

The fact that various demographic variables yielded significant differences means that certain subgroups are likely to weigh these various dimensions differently. These findings support the view that sex, age, ethnic/background, and location of medical school may differentially affect the ranking process and that different types of students may have different needs. However, the issue of the statistical versus the practical significance of these findings should be emphasized. The large number of subjects in conjunction with the small mean differences obtained calls into question the practical significance of these statistically significant results.

Finally, an important limitation of the study reported here should be mentioned. Since family practice residents who were already in their residencies were sampled, it is conceivable that timing may have influenced the results somewhat. The subjects were asked to recall what they weighed when looking at programs as much as six months earlier. Consequently, where a resident finally went for training could have influenced his memory about the relative importance of variables. For example, the resident who did not match with his first-ranked program which was near his parents' home may have retrospectively viewed geography as less important to the ranking than it actually was at the time.

References

1. Ness, P. M., and Weiler, J. M. The Internship and Residency Application Hassie. *Ann. Intern. Med.*, **81**:107–109, 1974.
2. Raff, M. J., and Schwartz, I. S. An Applicants' Evaluation of a Medical House Officership. *N. Engl. J. Med.*, **291**:601–605, 1974.
3. Decker, D. L., and Cohen, A. S. Hospital Postgraduate Training: Factors Affecting Prospective Intern's Ranking of a Municipal Hospital Program in Internal Medicine. *Am. J. Med. Sci.*, **281**:122–129, 1981.
4. Paiva, R. E. A., Juan, I. R., and Haley, H. B. Factors in Internship Choice. *J. Med. Educ.*, **49**:343–350, 1974.
5. Eagleson, B., and Tobolic, T. A Survey of Students Who Chose Family Practice Residencies. *J. Fam. Pract.*, **6**:111–118, 1978.

8/17/83
A3273-8

Vol. 58 No. 8 August 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

How Medical Students Learn
Nu Viet Vu and Alberto Galofre

Women's Studies in Medical Education
Nancy C. A. Roeske

Essential Areas for Behavioral Science Training: A Needs Assessment Approach
S. Graham Kosch and John J. Dallman

Effects of Three Types of Lecture Notes on Medical Student Achievement
I. Jon Russell, Timothy N. Caris, Gary D. Harris, and William D. Hendricson

Medical Student Education in Life-Support Skills
Fred J. Spielman, Charles A. Murphy, Jr., and Kenneth J. Levin

The Effect of a Clinical Clerkship on Attitudes of Medical Students Toward Anesthesiology
Satwant K. Samra, Wayne Davis, Sujit K. Pandit, and Peter J. Cohen

Journal of Medical Education

Volume 58 • Number 8 • August 1983

How Medical Students Learn—Nu Viet Vu and Alberto Galofre 601

Women's Studies in Medical Education—Nancy C. A. Roeske 611

Essential Areas for Behavioral Science Training: A Needs Assessment Approach—S. Graham Kosch and John J. Dallman 619

Effects of Three Types of Lecture Notes on Medical Student Achievement—I. Jon Russell, Timothy N. Caris, Gary D. Harris, and William D. Hendricson 627

Medical Student Education in Life-Support Skills—Fred J. Spielman, Charles A. Murphy, Jr., and Kenneth J. Levin 637

The Effect of a Clinical Clerkship on Attitudes of Medical Students Toward Anesthesiology—Satwant K. Samra, Wayne Davis, Sujit K. Pandit, and Peter J. Cohen 641

A Preliminary Analysis of Accreditation Criteria for Surgical Procedures by Orthopedic Residents—Judith B. Willis, Dolores J. Burchell, and Curtis M. Hanson 648

Communications: **A Study of Merit Pay in Medical Schools**—P. Joseph Vertucci and Delese Wear 655

Computer-Aided Ranking of Residency Program Applicants—John B. McCabe and Ronald L. Herold 656

Efficiency in Examining Adult Patients on Preceptorship—S. E. Sivertson and Howard L. Stone 657

Pediatric House Staff Communication Skills: Assessment and Intervention—M. Lee Dickinson, Michelle Huels, and M. Dianne Murphy 659

Public Health and Preventive Medicine in the Curricula of Osteopathic Medical Schools—Marjorie E. Nelson 662

Evaluation of Teaching Programs for Male and Female Genital Examinations—Lila A. Wallis, Kenneth Tardiff, and Kathleen Deane 664

Medical Student Instruction in Hematology Via Computer-Video Material—Lawrence A. Wheeler 667

Editorial: Student Financial Planning and Management at U.S. Medical Schools 669

Book Reviews 671

Bibliography 673

Letter to the Editor 678

Officers of the Association and Members of the Executive Council, 1982-83

CHAIRMAN: Steven C. Beering, *Purdue University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

and failure to acknowledge parental concerns and provide information on the part of residents are items that contribute significantly to patient dissatisfaction which in turn negatively affect patient compliance. These skills and behaviors are also important in view of research which suggests that empathy and respect are two of the core conditions related to positive outcome in any helping relationship (4).

It is not completely clear why the program reported here and other intervention programs were not successful in changing some of the residents' behaviors. Some of their skills and behaviors may reflect personality traits and emotional responses that are not responsive to the kind of educational effort described here or that are simply more resistant to change. It is also possible that much of the resident's training dictates against empathic behavior because it may be seen as time-consuming and/or as interfering with the resident's ability to make objective judgments.

The other deficient items pertain to those skills and behaviors addressed by the functional area of the CASPI—facilitating a full and mutual exchange of information. It appears that house staff members do not encourage free-flowing, mutual communication. Without intervention, residents appear to lose an earlier willingness (as seen in preintervention PL-1 scores) to encourage questions.

It appears that at the end of their residencies, the house staff members knew how to structure an interview and how to conduct it in an orderly, understandable, and professional way. As for the affective area, the residents left the program much the same way they had entered it, and perhaps this has some relevance for medical school selection procedures. It was in the functional area, facilitating a mutual exchange of information, that the program had the most effect, whereas time in the system had the least; therefore, the functional area may prove the most productive for future efforts.

References

1. STILLMAN, P. L., and SABERS, D. L. Using a Competency-Based Program To Assess Interviewing Skills of Pediatric House Staff. *J. Med. Educ.*, **53**:493–496, 1978.
2. KORSCH, B. M. Teaching Interviewing. *Pediatrics*, **55**:305–306, 1975.
3. COMSTOCK, L. M., HOOPER, E. M., GOODWIN, J. M., and GOODWIN, J. S. Physician Behaviors That Correlate with Patient Satisfaction. *J. Med. Educ.*, **57**:105–112, 1982.
4. CARKHUFF, R. R. *Helping and Human Relations/A Primer for Lay and Professional Helpers* (Vols. I and II). New York City: Holt, Rinehart & Winston, 1969.

Public Health and Preventive Medicine In the Curricula of Osteopathic Medical Schools

Marjorie E. Nelson, M.D.

Little information can be found in medical education literature on the preventive medicine/public health (PM/PH) content in the curriculum of U.S. medical schools. What does exist either refers to allopathic schools only or does not distinguish between allopathic and osteopathic schools. Colton (1) reported on two surveys of biostatistics in U.S. and Canadian medical schools, and Levy (2) surveyed U.S. medical schools vis-a-vis the teaching of occupational health. Results of an unpublished study on PM/PH in allopathic schools were presented at the 1981 Annual Meeting of the Association of Teachers of Preventive Medicine by Dr. F. Marian Bishop,

---

This paper was presented to the American Osteopathic Academy of Public Health and Preventive Medicine, October 4, 1982, in Chicago, Illinois.

Dr. Nelson is an assistant professor in the Department of Family Medicine at Ohio University College of Osteopathic Medicine, Athens.

chairman of the Department of Community Medicine, University of Alabama School of Medicine branch at Huntsville.

Survey

A questionnaire was sent to the 15 U.S. osteopathic medical schools in the fall of 1981 requesting information on the number of PM/PH faculty members, existence of a department or section of PM/PH, and required and elective hours in PM/PH by year and by content. Six traditional subject areas were specifically noted: biostatistics, epidemiology, occupational/environmental health, community medicine, public health, and preventive medicine. Responses were obtained from 14 schools.

A majority (86 percent) of the osteopathic schools reported some required PM/PH hours in their curriculum; that percentage is comparable with allopathic schools (84 percent). These hours tend to occur in the first two years in both groups of schools. Very few have required hours in all four years. One-third of the osteopathic schools reported PM/PH electives, usually in the third and fourth years. Electives are more common in schools with PM/PH departments. Departments of PM/PH exist in 50 percent of the osteopathic schools and 79 percent of the allopathic schools. The number of PM/PH faculty members per school ranged from 0.1 to 15 full-time equivalents. Comparable data for allopathic schools are not available, but a 1963 survey of medical schools by the Institute for Advancement of Medical Communication found that the average department of preventive medicine had 4.8 members.

Table 1 summarizes patterns of required PM/PH curriculum time in both groups of professional schools. Clearly, there is no consensus on the appropriate amount of curriculum time for this subject matter. Neither is there complete consensus on content. Seventy-one percent of the osteopathic schools reported required hours in biostatistics (mean 4.5), epidemiology (mean 4.0), and public health (mean 5.4). Colton's survey showed that 72 percent of the medical schools required biostatistics, and the median number of hours was 14. Occupational/environmental health was required in the curriculum of 50 percent of the osteopathic schools, and the mean time was 5.3 hours. This compared favorably with Levy's survey showing that 30 percent required it in their curricula with a mean time of 5.6 hours. Fifty percent of the osteopathic schools also required hours in community medicine (mean 3.8) and preventive medicine (mean 5.6).

Discussion

Traditionally, osteopathic schools have prided themselves on training a preponderance of primary care physicians. If they continue to have as a goal the training of well equipped primary care physicians, their curricula should focus on relevant skills. All six core areas of PM/PH are germane to primary care. A practicing physician's continuing education depends a great deal on the ability to interpret and apply the literature. Weiss and Samet (3) showed that physicians who had had courses in biostatistics and epidemiology scored significantly higher in such ability than those who had not.

TABLE 1

Required Hours of Preventive Medicine/Public Health in Medical School Curricula

	First and Second Years		Third and Fourth Years	
	Osteopathic	Allopathic*	Osteopathic	Allopathic*
Range†	0–150	0–480	0–180	0–400
Mean	37.4	52.2	41.6	56
Median	16	36	0	0

* From an unpublished study by Bishop (see text).

† 87 percent of allopathic schools and 92 percent of osteopathic schools reported some required hours at some time in their curriculum. For the first two years it was 78 percent for allopathic and 92 percent for osteopathic schools. In the third and fourth years, the percentages were 64 and 62 respectively.

Whether a physician is dealing with notifiable diseases, nosocomial infections, or a utilization review committee, a basic understanding of public health principles and structures will ultimately enhance patient care. What are the risks of health hazard appraisal? What constitutes a good fitness program for a geriatric patient? Practicing physicians deal with preventive medicine issues constantly. They need training in the preventive medicine interventions that will become as standard in the medical practice of the 1990s as "Pap" smears and immunizations are today. The proliferation of occupational and environmental exposures to hazardous substances makes it imperative that a physician be equipped to take an adequate occupational and environmental exposure history and be able to relate a positive history to likely diseases and appropriate intervention.

No physician would pick a community in which to practice without thorough knowledge of the available hospital facilities. But how many know how to assess other equally important resources in the community? A community medicine curriculum should equip the physician to locate and use appropriately community resources to enhance the care and well-being of their patients. Thus, any medical school intending to train primary care physicians should include required time in all six core areas of PM/PH and provide an adequate number of faculty members in public health and preventive medicine to accomplish this.

References

1. COLTON, T. An Inventory of Biostatistics Teaching in American and Canadian Medical Schools. *J. Med. Educ.*, **50**:596–604, 1975.
2. LEVY, B. S. The Teaching of Occupational Health in American Medical Schools. *J. Med. Educ.*, **55**:18–22, 1980.
3. WEISS, S. T., and SAMET, J. M. An Assessment of Physician Knowledge of Epidemiology and Biostatistics. *J. Med. Educ.*, **55**:692–697, 1980.

Evaluation of Teaching Programs For Male and Female Genital Examinations

Lila A. Wallis, M.D., Kenneth Tardiff, M.D., and Kathleen Deane

Problems related to the medical student's first pelvic examination have been well recognized (1), and the inadequacy of traditional methods of teaching breast and pelvic examinations to medical students has been discussed elsewhere (2–4). In 1972 Kretzschmar introduced the concept of teaching associates, nonphysician women trained to teach the breast and pelvic examinations while serving as both instructors and subjects (5). In the past decade, this innovative technique has been accepted in more than 60 medical schools in this country. Evaluation of teaching associate programs by students has been uniformly positive, and the students perform better on subsequent examinations than those taught by traditional methods (6–8).

While medical students' reactions to their first pelvic examination have been studied, little attention has been given to their first genital-rectal examination on a male patient, and few medical schools have implemented a male teaching associate program (9). In the spring of 1982 a male teaching associate (MTA) program was introduced at Cornell University Medical College to teach sophomore medical students the examination of the male genitalia and rectum. This program was

---

Dr. Wallis is clinical associate professor of medicine and Dr. Tardiff is associate professor of psychiatry and assistant professor of public health at Cornell University Medical College, New York, New York. Ms. Deane is a doctoral candidate in psychology at the State University of New York at Stony Brook.

10-21-/83
A3273-8

Vol. 58 No. 10 October 1983

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Identification of Medical Student Problems and Comparison with Those of Other Students
Oliver Bjorksten, Susan Sutherland, Clinton Miller, and Thomas Stewart

The Epidemiology of Minor Illnesses Among Medical Students
Matilde M. Irigoyen and Michael N. Mulvihill

Attitudes of House Officers Toward a Hospice on a Medical Service
L. Mary Mathew, Dennis W. Jahnigen, James H. Scully, Patt Rempel, Thomas J. Meyer, and F. Marc LaForce

Teaching Biopsycho-Ethical Medicine in a Family Practice Clerkship
Robert C. Cassidy, David L. Swee, and Marian R. Stuart

Practical Procedures in Internal Medicine: A Workshop for Fourth-Year Medical Students
Stuart Frank and Sergio Rabinovich

Development of an Internal Medicine Clerkship by a Department of Medicine
Gordon L. Noel

BEST AVAILABLE COPY

Journal of Medical Education

Volume 58 • Number 10 • October 1983

Identification of Medical Student Problems and Comparison with Those of Other Students—Oliver Bjorksten, Susan Sutherland, Clinton Miller, and Thomas Stewart 759

The Epidemiology of Minor Illnesses Among Medical Students—Matilde M. Irigoyen and Michael N. Mulvihill 768

Attitudes of House Officers Toward a Hospice on a Medical Service—L. Mary Mathew, Dennis W. Jahnigen, James H. Scully, Patt Rempel, Thomas J. Meyer, and F. Marc LaForce 772

Teaching Biopsycho-Ethical Medicine in a Family Practice Clerkship—Robert C. Cassidy, David E. Swee, and Marian R. Stuart 778

Practical Procedures in Internal Medicine: A Workshop for Fourth-Year Medical Students—Stuart Frank and Sergio Rabinovich 784

Development of an Internal Medicine Clerkship by a Department of Medicine—Gordon L. Noel 788

Developing a Cancer Prevention Elective Course—Jack L. Mason, Leslie Walker-Bartnick, Helene B. Hess, Herbert L. Muncie, Jr., J. Richard Hebel, and Murray M. Kappelman 796

The Use of Videotape Programs To Teach Interpersonal Skills—Stephen C. Schoonover, Ellen L. Bassuk, Roger Smith, and Dean Gaskill 804

Communications: Training the Primary Care Internist To Provide Care in Skilled Nursing Facilities—John A. Robbins 811

- **Penetrating the Information Maze**—Marjorie B. Wannarka and Henry T. Lynch 813
- **Physicians' Views of the Teaching and Utility of Courses in Epidemiology and Biostatistics**—John M. Krall, David S. Hall, Barbara K. Garland, and R. John C. Pearson 815
- **Evaluation of a Small-Group Support Program for First-Year Medical Students**—Fred L. Ficklin, Jill D. Hazelwood, James E. Carter, and Robert H. Shellhamer 817
- **Type A Behavior and Achievement of Freshman Medical Students**—Thomas M. Wolf and Grace E. Kissling 820
- **The Socialization of Medical Educators**—Rose Yunker and Emil Petrusa 822
- **Analysis of Drug Information Requested by Medical Students and House Staff Members**—A. Thomas Taylor 824

Editorial: The National Matching Program—1984 827

Datagram: Parental Income of 1981 First-Year Medical School Applicants and Accepted Students 829

Bibliography 832

Letter to the Editor 836

Officers of the Association and Members of the Executive Council, 1982–83

CHAIRMAN: Steven C. Beering, *Purdue University*
CHAIRMAN-ELECT: Robert M. Heyssel, *Johns Hopkins Hospital*
IMMEDIATE PAST CHAIRMAN: Thomas K. Oliver, Jr., *University of Pittsburgh*
PRESIDENT: John A. D. Cooper, *AAMC, Washington, D.C.*

COUNCIL OF DEANS
Richard Janeway, *Bowman Gray**
John E. Chapman, *Vanderbilt University*
Ephraim Friedman, *Albert Einstein*
Fairfield Goodale, *Medical College of Georgia*
Louis J. Kettel, *University of Arizona*
William H. Luginbuhl, *University of Vermont*
Richard H. Moy, *Southern Illinois*
M. Roy Schwarz, *University of Colorado*
Edward J. Stemmler, *University of Pennsylvania*

COUNCIL OF ACADEMIC SOCIETIES
Frank C. Wilson, *University of North Carolina**
David M. Brown, *University of Minnesota*
Robert L. Hill, *Duke University*
Joseph E. Johnson, III, *Bowman Gray*

COUNCIL OF TEACHING HOSPITALS
Earl J. Frederick, *Children's Memorial Hospital**
Robert Frank, *Barnes Hospital*
Mitchell T. Rabkin, *Beth Israel Hospital*
Haynes Rice, *Howard University Hospital*

ORGANIZATION OF STUDENT REPRESENTATIVES
Ed Schwager, *University of Arizona**
Pamelyn Close, *University of Tennessee*

DISTINGUISHED SERVICE MEMBER
Manson Meads, *Bowman Gray*

* Chairman of respective organization.

DATAGRAM

Parental Income of 1981 First-Year Medical School Applicants and Accepted Students

An issue which is frequently being encountered is to what extent medicine is perceived as a viable educational pathway for lower and middle income students and for the racial/ethnic groups underrepresented in medicine. The latter are defined as black Americans, American Indians, Mexican Americans, and mainland Puerto Ricans. Presented here are data on the income of parents of the 1981 applicants to and students accepted by U.S. medical schools. Table 1 gives data on all men and women applicants and accepted students with parents in the income ranges of $14,999 and below, $15,000 to 29,999, and $30,000 and above. Table 2 contains data for the four racial/ethnic groups with parents in these same income ranges.

Table 2 indicates that white students had the lowest representation in the $14,999 and below range, with 12 percent of the white applicants and 10 percent of the white accepted students falling in this category. American Indians had the second lowest representation with 21 percent of the applicants and 14 percent of the accepted students. They were followed by Mexican Americans with 37 percent of the applicants and 36 percent of the accepted students and black Americans with 39 percent of the applicants and 33 percent of the accepted students. Mainland Puerto Ricans had the lowest parental income with 49 percent of the applicants and 42 percent of the accepted students in this category. Conversely, in the $30,000 or more stratum, the hierarchy of group representation is reversed, with only 14 percent of the mainland Puerto Rican applicants and 16 percent of the mainland Puerto Rican accepted students having a parental income in this range. Whites were heavily represented with 44 percent of the white applicants and 46 percent of the accepted students at or above this level. Caution must be exercised in interpreting some of these categories since the numbers upon which the percentages are based are small.

The data in Table 1 show almost no varia-

TABLE 1

Parental Income of Men and Women Medical School Applicants and Accepted Students, 1981 First-Year Class*

Parental Income	All		Men		Women	
	Applicants	Accepted	Applicants	Accepted	Applicants	Accepted
$14,999 or less						
Number	4,594	1,883	2,920	1,246	1,674	637
Percent	16	13	15	13	17	14
$15,000 to 29,999						
Number	8,968	4,192	6,086	2,919	2,882	1,273
Percent	31	30	32	30	30	28
$30,000 or more						
Number	11,405	6,254	7,790	4,369	3,615	1,885
Percent	39	43	40	43	38	42
No response						
Number	4,005	2,070	2,517	1,329	1,488	741
Percent	14	14	13	14	15	16
Total						
Number	28,972	14,399	19,313	9,863	9,659	4,536
Percent	100	100	100	100	100	100

* Includes only those applicants who took the Medical College Admission Test in either 1980 or 1981 (approximately 80 percent of applicants); percentages may not total 100 due to rounding.

tion between the percentages of men and women applicants or between the percentages of men and women accepted students in the three income ranges. However, it is evident from these figures and those in Table 2 that for the 1981 first-year class, more than double the number of applicants had parents with incomes that fell either in the $30,000 or more or in the $15,000 to 29,999 categories compared with families with parental incomes in the $14,999 and below income classification.

A comparison of these income ranges over a span of years would be necessary to determine trends. The data also should be viewed in the context of the general income range of college graduates (1). The one-year presentation here, however, evidences a distribution in which those from the underrepresented minority groups are heavily skewed toward the $14,999 and below range while white applicants and accepted students are more concentrated in the $30,000 and above income category.

ROBERT J. BOERNER, *director, and* MARIA THOMAE-FORGUES, *research associate, Division of Student Programs, Association of American Medical Colleges, Washington, D.C.*

Reference

1. BOERNER, R. J. Family Income of Medical School Applicants and Acceptees and of College Students. *J. Med. Educ.*, **52**:948–949, 1977.

TABLE 2

Parental Income of All Medical School Applicants and Accepted Students, by Racial/Ethnic Groups, 1981 First-Year Class*

Parental Income	All		Black		White		American Indian		Mexican American		Puerto Rican-Mainland	
	Applicants	Accepted	Applicants	Accepted	Applicants	Accepted	Applicants	Accepted	Applicants	Accepted	Applicants	Accepted
$14,999 or less												
Number	4,594	1,883	826	305	2,680	1,150	26	7	161	86	89	42
Percent	16	13	39	33	12	10	21	14	37	36	49	42
$15,000 to 29,999												
Number	8,968	4,192	642	282	7,181	3,409	37	17	143	84	49	26
Percent	31	30	31	31	30	29	30	34	32	34	27	26
$30,000 or more												
Number	11,405	6,254	415	223	9,880	5,450	44	17	90	50	25	16
Percent	39	43	19	25	44	46	36	34	21	20	14	16
No response												
Number	4,005	2,070	249	89	3,169	1,697	16	8	46	25	21	15
Percent	14	14	12	10	14	14	13	16	10	10	11	15
Total												
Number	28,972	14,399	2,132	899	22,910	11,706	123	49	440	245	184	99
Percent	100	100	100	100	100	100	100	100	100	100	100	100

* Includes only those applicants who took the Medical College Admission Test in either 1980 or 1981 (approximately 80 percent of applicants); percentages may not total 100 due to rounding.